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DRIFTING ALGAE.

FRANK S. COLLINS.

THE conditions for collecting marine algae differ much from those for other plants. Practically all marine algae are under water part of the time, and more than half the number of species grow below low water mark; some of course can be distinguished when passing over them in a boat, but many of the most interesting species grow at a depth below the range of vision. The only way to get at these in their homes is by dredging, a slow, uncertain process. As Farlow [1] says of the dredge, "One sometimes secures by its means rare species, but as a rule, a day of dredging is a day wasted." The only way in which good results can be secured, is by a thoroughly equipped expedition, working from a steamer and going carefully over the selected area systematically. That such work may produce good results is shown by the recent Vol. XXXI of the Bulletin of the Bureau of Fisheries, containing the Survey of the Wood's Hole region. But as to the prospect of getting a fairly complete representation of the flora of a region in this way, the land botanist can judge if he imagines himself getting the flora of a meadow by going over it in an aeroplane in a dark night, with a long-handled rake.

Ever since the beginning of the study of algae, our knowledge of the sublitoral [2] flora has been obtained from the "rejectamenta," plants washed ashore; often immense quantities of algae, in great variety,

[1] Farlow, The marine algae of New England, p. 22, 1881.

[2] Sublitoral is here used in the sense of below the litoral, the litoral region including the range between tide marks; in zoological terminology it has sometimes been used as meaning partly or nearly litoral, the prefix being used in the same sense as in subtropical; I use it here in the same sense as in subterranean.

are thrown ashore on beaches after storms. That this is the normal source for material is recognized in all the text books. "Collecting on sandy or gravelly beaches is very simple. One finds there only the Florideae and larger brown sea-weeds that are washed ashore after a storm." [1] "First, from the mass of material which the sea throws up upon the beaches and leaves behind it when the tide goes out. . . . By careful search among this material you will find all the deep water forms." [2] "A storm is often more productive than a dredging expedition." [3] "At the time of maturity, the algae of the deeper waters are more or less readily torn away from their attachments, rise to the surface or near it, and are drifted ashore. Consequently it is well to examine the masses of driftweed driven ashore, especially after storms, in search of these inhabitants of the deeper waters." [4] As might be inferred from the quotations given above, authors of manuals and floras have included algae picked up with those found actually attached; indeed, not to have done so would have left out a considerable part of the species, among them some of the most interesting. Occasionally attention has been called to some plant, from its recorded distribution unlikely to occur in the region where it came ashore, and it has been noted only as a waif, but as a rule, the question of origin has not been raised. Recently more consideration has been given to possible long distance transportation; Sauvageau, preliminary to giving a list of the algae of the Bay of Biscay,[5] says "Le temps a toujours été très calme durant mon séjour en Espagne, et les algues déposées sur le rivage n'étaient pas apportées de loin, comme cela arrive souvent après une tempête."

Reinke [6] enumerates three species which he considers as transported from their homes to the western Baltic, and not native there. Rosenvinge [7] gives a list of 48 species coming ashore on the west coast of Jutland, with indications as to their probable origin. Schiller's

[1] Farlow, l. c., p. 21.

[2] Hervey, Sea Mosses, p. 14, 1881.

[3] Murray, An introduction to the study of seaweeds, p. 27, 1895.

[4] Setchell, Directions for collecting and preserving marine algae. Erythea, Vol. VII, p. 24, 1899.

[5] Sauvageau, Note preliminaire sur les algues marines du golfe de Gascogne. Journal de Botanique, Vol. XI, p. 3 (of reprint), 1897.

[6] Reinke, Ueber Gaste der Ostseeflora. Berichte der deutschen Botanische Gesellschaft, Vol. X, p. 2, 1892.

[7] Rosenvinge, Om fremmede Alger ilanddrevne paa Jyllands Vestkyst. Bot. Tidsskrift, Vol. XXVII, p. 83, 1905.

recent paper [1] is concerned chiefly with algae that have a definite and prolonged unattached existence, usually with change of form from that of the fixed state, to adapt the plant to the unattached state; the possibility of transportation to considerable distances is however also discussed. That unless this possibility is taken into account one may be led into serious errors, was shown me by a recent experience.

On October 8, 1913, I visited the ocean shore of Eastham, Massachusetts, near the Nauset lighthouse. From Chatham to Highland Light in Truro the shore stretches for about 25 miles in a nearly straight line; a rather steep beach of shifting sand, overlooked by sand dunes. No algae ever grow here, and as off shore the bottom is the same loose sand with more or less shifting bars a short distance out, the occurrence of algae below low water mark is improbable. All I had found on my many visits here had been scraps, more or less battered, the same as one might find floating anywhere in Massachusetts Bay or Nantucket Sound. But on this occasion as I looked from the dunes I saw plants of good size washing up and down in the waves, and on going down I found to my surprise that the beach was strewn with *Laminaria*, and that not *L. Agardhii* Kjell., the common species of southern New England, but *L. longicruris* De la Pyl., a northern species, occurring south of Nahant only at a few isolated stations. They were not battered and waterworn plants, but perfectly fresh, and were of all sizes from young plants 3–4 dm. high, to mature individuals, with stipe alone over three meters long. The small plants were often in clumps of a number of individuals, still attached at base to shells or pebbles; the laminae often bore abundant fruit. Along with the *Laminaria* were, almost equally abundant, but from their smaller stature less conspicuous, *Fucus vesiculosus* L., *Ascophyllum nodosum* (L.) Le Jolis, *Desmarestia aculeata* (L.) Lamour., and *Rhodymenia palmata* (L.) Grev. There had been a heavy surf for several days, and my first thought was that some colony in deeper water had been struck by it, but from what I knew of the bottom, I concluded that this would be very unlikely; moreover *Fucus* and *Ascophyllum* are litoral plants. They occur more or less all along the southern New England coast, but I know no station except Newport, Rhode Island, where the plants are at all luxuriant; usually they are much smaller than the northern form, or than the plants now in

[1] Schiller, Ueber Algentransport und Migrationsformationen im Meere. Internationale Revue der gesamten Hydrobiologie und Hydrographie, Vol. II, p. 62, 1909.

question. On the *Ascophyllum* were large tufts of *Polysiphonia fastigiata* (Roth) Grev., which occurs south of Cape Cod only rarely and in reduced form. The *Rhodymenia* fronds were large, often 3–4 dm. high and nearly as broad; and finally I found one fine tuft of *Halosaccion ramentaceum* (L.) J. Ag. and several plants of *Monostroma fuscum* (Post. & Rupr.) Wittr; the *Halosaccion* has not been recorded south of Marblehead, and a doubtful record of the *Monostroma* at Newport is the only one south of Boston. As epiphytes on the *Laminaria* I noted *Ceramium rubrum* (Huds.) Ag., *Chantransia* sp.?, *Pylaiella littoralis* (L.) Kjell., *Ectocarpus confervoides* (Roth) Le Jolis, *Antithamnion floccosum* (Muell.) Kleen and *Rhodochorton Rothii* (Eng. Bot.) Näg.[1]

All this taken together left no doubt in my mind that the northeast storm had brought the whole collection (there were thousands of Laminarias in sight) from the shores of northern New England. From the absence of other species of *Laminariaceae*, it is probable that they came from some quite limited station. I know of no point on the Massachusetts coast where *Laminaria longicruris* grows in large numbers, unmixed with other species of *Laminaria* or with *Alaria*, but on the Maine coast, east of Portland, there are stations where *L. longicruris* is abundant and unmixed with other *Laminariaceae*, usually in channels where there is a rather swift tidal current, but not exposed to the surf. If a gale happened to blow in a quarter that would send a heavy surf up such a channel, there might be torn up just such a "formation" or "facies" as I found, and the northeast wind might then carry it to the place where I found it. With the wind then prevailing it could hardly have originated west of Penobscot Bay, which would give 150 miles as the least distance it must have travelled. On returning to the beach the next day, I found the plants of the day before in a narrow windrow at high water mark, and rapidly decaying; the beach below and the water were bare and empty as usual.

Now if I had been on an unfamiliar shore, and was making a record of the plants of the region, I think that under the circumstances recorded, I should not have hesitated to enter in the list all the species I have named above; I have no doubt that some anomalies in regional

[1] It is noteworthy that among the 48 species recorded by Rosenvinge as coming ashore at Jutland, 44 were epiphytes on *Ascophyllum nodosum* and *Himanthalia lorea* (L.) Lyng. As long as the host plant is intact, the epiphytes find little change from their normal conditions, though most of them would speedily perish if detached from the host.

lists may be due to this cause; in this case it is only because the "consignment" came ashore at a point itself barren that the detection and correction is so easy; if it had been at a place where deep water plants from just off shore were also coming in, it might be quite perplexing. It may seem like severity to put all deep water plants on the waiting list until some dredging expedition vouches for their eligibility, but it may be the only safe way.

North Eastham, Massachusetts.

THE AMERICAN VARIATIONS OF POTENTILLA PALUSTRIS.

M. L. Fernald and Bayard Long.

(Plate 106).

In 1908 attention was called by Dr. Theodor Wolf,[1] in his *Monographie der Gattung Potentilla,* to the fact that in North America *Potentilla palustris* is not a uniform species but that the little known var. *villosa* (Pers.) Lehm., a plant of rare occurrence in northern Europe and possibly Greenland, is also found on the continent of North America (Cartwright, Manitoba). In 1909 our knowledge of var. *villosa* was sufficient to justify the statement that it is found "Throughout the St. Lawrence system from n. N. S. and e. Que. to L. Superior and L. Winnipeg,"[2] and in 1910 the plant was recorded as "the common form of the species in eastern Washington County, Maine."[3] In the study of this and other variants of *P. palustris* it has been necessary to look with some detail into the plant throughout its known range and into the very different treatments of its variations by authors, either as a *Potentilla* or as a separate genus, *Comarum.* As a result of these studies it seems to the writers that the plant in America falls into three well marked varieties with pronounced geographic ranges.

[1] Wolf. Mon. Pot. 76 (1908).
[2] Robinson & Fernald, Rhodora, xi. 48 (1909).
[3] Fernald & Wiegand, Rhodora, xii. 140 (1910).

As indicated by the *Species Plantarum* Linnaeus intended as his *Comarum palustre*[1] the common European plant. He gave no description but cited numerous previous works, *Flora Lapponica*, etc., the *Quinquefolium palustre rubrum* of Bauhin and the *Pentaphyllum palustre* of Cordus, and gave the habitat "*in* Europae *uliginosis*." Subsequent European students of the group, such as Lehmann and Wolf, have accepted as typical *Potentilla palustris* the common plant of Eurasia (fig. 1) and northern North America, with leaflets oblong-lanceolate, green and glabrous or merely puberulent above, glaucous and glabrous or merely puberulent beneath,[2] and have recognized a single notable variety, var. *villosa* (Pers.) Lehm., a plant figured by Plukenet and said to come from Sweden and Ireland.

In 1836, however, Rafinesque,[3] taking up the Linnean genus *Comarum* "(or Pancovia or Potentilla)" said: "I can increase it to 3 Species; all in my Autikon. Only one was known," and treated "*Comarum* (or Pancovia or Potentilla)" *palustre* as a strictly Old World plant, described "fol. pinnatis"; separated the "C. *palustre* of all the American botanists!" as "*Comarum* (Panc. Pot.) *digitatum*," "fol.....digitatis"; and described as another new species "*Comarum* (Panc. Pot.) *angustifolium*," "fol. pinnatis,.... foliolis 5 cuneatis angustis" from "Oregon or N. W. Amer." In the *Autikon Botanikon*, in 1840, Rafinesque somewhat modified his treatment, coining the name *C. tomentosum* for Persoon's *C. palustre, β villosum;* altering the range of his *C. angustifolium* to read "Origon and Boreal America, Ohio: very peculiar, leaves narrow smooth, fl. small &c."; and publishing a new *C. angustifolium*, "*Var. parvifolium* Raf. folioles 5–7 small smooth cuneate or elliptic, petiols membranose, flowers very small, branches uniflore; Labrador, 3 to 10 inches high, folioles less than uncial."[4]

More recently, in the *North American Flora*, Rydberg[5] has stated that the typical form of the species, with "leaflets....elliptic or oval," occurs in "Northern and subalpine Europe and Asia; also subarctic and arctic America, from Greenland and Labrador to Alaska," while

[1] L. Sp. Pl. 502 (1753).

[2] "Foliola...oblongo-lanceolata, acute-serrata, superiore facie laete-viridia, dorsa glaucescentia, venosa" — Lehm. Mon. Pot. 53 (1820); "foliola...oblongo-lanceolata acute et aequaliter serrata, supra viridia, subtus glauca, utrinque vel subtus tantum puberula" — Wolf, Mon. Pot. 75 (1908).

[3] Raf. Fl. Tell. pt. ii. 55, 56 (1836).

[4] Raf. Aut. Bot. 170 (1840).

[5] Rydb. N. A. Fl. xxii. 355 (1908).

"the more common American form (*C. angustifolium* Raf.)," with leaflets "linear-oblong," extends "south to New England, Minnesota, Wyoming, and California"; thus seeming to indicate that the common American plant has recognizably narrower leaflets than the European. In their study of this species, however, the writers have been unable to make out any definite difference in the shape of leaflets to separate from the European plant the common plant of southern British America and the Northern States, which extends southward at least to New Jersey, Pennsylvania, Ohio, Indiana, Illinois, Iowa, Wyoming and California. In the plant of Europe (fig. 1) the leaflets are, of course, variable in size and form, but they have in general an oblong-lanceolate to oblanceolate outline, and the various Eurasian specimens are readily matched by specimens from Canada and the northern United States. In the Eurasian plant the terminal leaflet of the primary leaves varies (in a rather small series of specimens examined) from 2–7 (average 4) cm. in length, though some of the European plates show that they may be longer. In a much larger American series the common plant has the terminal leaflet ranging in length from 2–10 (av. 5.2) cm. In the Eurasian plant the terminal leaflet ranges from 0.9–2.7 (av. 1.6) cm. wide, in the American from 0.7–3.8 (av. 1.8) cm. wide. Expressed as a proportion, the breadth of the terminal leaflet in the Eurasian plant is $\frac{3}{10}$–$\frac{1}{2}$ as great as the length; in the common American plant the terminal leaflet is $\frac{1}{6}$–$\frac{1}{2}$ as broad as long, but it should be noted that the plants with narrowest leaflets come for the most part from the West — Montana, Washington, Oregon, etc. and are undoubtedly the extreme which was separated by Rafinesque as *Comarum angustifolium* (fig. 2). Similar plants with the leaflets only $\frac{1}{6}$ as broad as long are found at scattered points eastward and the variant seems to be merely an extreme of the series rather than "the more common American form," for as already stated, the majority of American specimens seem to the writers quite inseparable from the Eurasian material.

The small-leaved plant of Labrador and Alaska (and the islands of northeastern Asia), however, which Rafinesque separated as *Comarum angustifolium,* var. *parvifolium* and which Rydberg identifies as the typical form of *Comarum palustre,* impresses us as sufficiently distinct for varietal recognition. The characters emphasized by Rafinesque, the small cuneate or elliptic leaflets and the few flowers ("branches uniflore"), seem to be reasonably constant in nearly all plants from

the coastal regions of Labrador and Alaska and the islands of Bering Sea (fig. 3), the elliptic to cuneate-obovate subtruncate or round-tipped leaflets being 1.3–4.5 (av. 2.75) cm. long and 0.9–2.5 (av. 1.5) cm. broad, ranging from $\frac{1}{2}$–$\frac{2}{3}$ as broad as long.

The other noteworthy variety, *Potentilla palustris,* var. *villosa* has already been referred to. In this plant the petioles, stipules, peduncles, bractlets, etc. are densely glandular-villous and the leaflets are villous or very densely sericeous. The plant (fig. 4) was figured and described by Plukenet[1] in 1692 from Sweden and Ireland; was taken up by Linnaeus in his *Flora Lapponica* as an unnamed variety "rarius observatur & plane non differt a naturali planta";[2] was recognized without discussion by Persoon as *Comarum palustre, β villosum*;[3] and was later transferred by Lehmann[4] to *Potentilla.*

That *Potentilla palustris,* var. *villosa* is a rare plant in Europe is indicated by the citation of specimens by European monographers. Plukenet, upon whose figure and description the variety rests, said that the plant came from Sweden and Ireland;[5] but in his *Revisio Potentillarum* Lehmann omitted the Swedish citation and referred to the plant only "in Groenlandia et Hibernia";[6] while Wolf, in his monumental *Monographie der Gattung Potentilla,* states that it appears to be a subarctic plant which Lehmann knew only from Greenland and Ireland, though J. Lange says in his *Conspectus Florae groenlandicae* that he has not seen it from Greenland but from Iceland. Wolf goes on to say that in an old English herbarium he has seen the plant from "Canada, Distrikt Cartwrigt [Cartwright, Souris Co., Manitoba] (leg. W. Scott 1891)."[7] With the exception of the Cartwright record and the old but perhaps erroneous report from Greenland, there seems to have been no suggestion that the plant occurs in North America until the notes published in Rhodora in 1909 and 1910; but the range of the plant in North America, from the Magdalen Islands, Nova Scotia, and Maine to Minnesota and Manitoba, indicates that, with us at least, it belongs to the Canadian rather than the subarctic zone.

[1] Pluk. Phyt. t. ccxii. f. 2 (1692).
[2] L. Fl. Lapp. 172 (1737).
[3] Pers. Syn. ii. 58 (1807).
[4] Lehm. Stirp. Pug. ix. 44 (1851).
[5] "*Pentaphyllum palustre rubrum, crassis, & villosis foliis Suecicum, & Hibernicum. hujus exemplar ex Suevia sibi allatum. nobis dedit* Reverend D. Stonestreet, *quod etiam Ornatissimus Vir D. Gideon.* Bonavert *ex Hibernia (qua invenit) rediens, nobis amicissime communicavit.*"— Pluk. Phyt. t. ccxii. f. 2 (1692).
[6] Lehm. Revis. Pot. 74 (1856).
[7] Wolf, Mon. Pot. 76 (1908).

In his account of *Potentilla palustris*, var. *villosa*, Lehmann said "*β villosa*, minor";[1] but as Wolf points out Lehmann's diagnosis "ist ungenau und zweideutig" and the var. *villosa* instead of being called "minor" should be described "foliolis magnis."[2] That the leaflets are larger than in other variations of *P. palustris* is well shown by measurements of the 16 sheets of specimens examined. In these plants the leaflets are as shown in Plukenet's figure and as later described by Rafinesque (as *Comarum tomentosum*), presumably from Plukenet's drawing: "more robust....with broader leaves [leaflets] obl[ong-] ellipt[ic]";[3] and measurements of the terminal leaflets of this American series of var. *villosa* show them to vary from 3.3–9.4 (av. 5.6) cm. long and from 1.4–3.1 (av. 2.2) cm. broad, or from $\frac{1}{3}$–$\frac{3}{5}$ as broad as long, thus indicating that the leaflets are relatively considerably broader than in either the European or the American plants which are passing as typical *P. palustris*. In fact, so many of the specimens from eastern America have leaves of which Plukenet's figure might easily pass as a tracing that one is led to infer that Lehmann's lack of a clear understanding of the variety was indicated not merely by his description of it as "minor" but by his characterization of Plukenet's figure as "mala."[4] The occurrence of this variety, with glandular-villous peduncles and rather large elliptic-oblong villous leaflets, so generally in the comparatively temperate belt of southern Canada and the adjacent States together with Lehmann's vagueness in describing the plant and Lange's statement that he does not know of it in Greenland, indicate that the Greenland record (originating with Lehmann and apparently unverified by later students) may wisely be treated with doubt until more clearly vouched for.

Another variant of *Potentilla palustris*, somewhat conspicuous in its extreme development, is forma *subsericea* (Becker) Wolf,[5] originally proposed by Becker as a variety.[6] Our own experience accords with that recently described by Mr. S. F. Blake,[7] and it is probable that the form is an ecological state rather than a true geographic variety, for the sericeous foliage is most often found in exsiccated spots or as a late development in colonies which earlier in the season produced the ordinary green leaves. Since this form of *P. palustris* is sometimes

[1] Lehm. l. c.

[2] Wolf, l. c.

[3] Raf. Aut. Bot. 170 (1840).

[4] Lehm. Mon. Pot. 53 (1820).

[5] Wolf, Mon. Pot. 76 (1908).

[6] Becker, Deutsch. Bot. Monatschr. xv. 85 (1897).

[7] S. F. Blake, Rhodora, xv, 165 (1913).

mistaken for var. *villosa* it is probable that some of the unverified or doubtful records of the latter belong to forma *subsericea.*

Briefly summarized our interpretation of the American variations of *Potentilla palustris* follows.

Potentilla palustris (L.) Scop. Figs. 1 and 2. Branches more or less minutely pilose or glandular above, 1–many-flowered: leaflets oblong-lanceolate to oblanceolate, acutish to obtuse, green and glabrous or merely puberulent above, glaucous and puberulent or sericeous beneath: the terminal leaflets of the primary leaves $\frac{1}{6}$–$\frac{1}{2}$ as broad as long, 2–10 (av. 4.6) cm. long, 0.7–3.8 (av. 1.7) cm. wide.— Fl. Carn. ed. 2, i. 359 (1772). *P. Comarum* Nestler, Mon. Pot. 36 (1816). *P. rubra* Hall. f. in Ser. Mus. Helv. i. 56 (1818). *P. digitata* and *angustifolia* Raf. Fl. Tell. ii. 55, 56 (1837). *Comarum palustre* L. Sp. Pl. 502 (1753). *C. digitatum* and *angustifolium,* Raf. l. c. 55, 56 (1837). *Argentina rubra* Lam. Fl. Fr. iii. 120 (1778). *Pancovia palustris, digitata,* and *angustifolia* Raf. l. c. 55, 56 (1837).— Cooler regions of Eurasia; in North America known from Labrador, Ungava, Keewatin, Yukon, and Alaska, southward to Newfoundland, Nova Scotia, southern New England, northern New Jersey, eastern and northern Pennsylvania, Ohio, northern Indiana, northern Illinois, northern Iowa, Wyoming and California.— Forma subsericea (Becker) Wolf, Mon. Pot. 76 (1908); S. F. Blake Rhodora xv. 165 (1913). Var. *subsericea* Becker, Deutsch. Bot. Monatsschr. xv. 85 (1897); Fernald & Wiegand, Rhodora, xii. 111, 140 (1910). Leaflets densely sericeous upon both surfaces. Apparently a form developed in exsiccated habitats or toward the end of the summer.

Var. **parvifolia** (Raf.) n. comb. Fig. 3. Similar, but smaller: branches 1–4-flowered: leaflets elliptic to cuneate-obovate, subtruncate or rounded at tip; the terminal $\frac{1}{2}$–$\frac{2}{3}$ as broad as long, 1.3–4.5 (av. 2.7) cm. long, 0.9–2.5 (av. 1.5) cm. broad.— *Comarum angustifolium,* var. *parvifolium* Raf. Aut. Bot. 170 (1840).— Labrador, Alaska, and islands of Bering Sea; examined from the following stations. Labrador: Ramah, *A. Stecker,* no. 323; Okkak, *Fratres Moravi;* Nain, *Lundberg;* Hopedale (large-leaved transitional plant), *Sornborger,* no. 131; Rigoulette, *Bowdoin College Expedition,* no. 270; Spear Harbor, *C. W. Townsend,* no. 44. Alaska: Cape Nome, *F. E. Blaisdell;* Anvik, *J. W. Chapman,* no. 4; St. Paul Island, *J. M. Macoun,* no. 71; Dutch Harbor, Unalaska, *E. C. Van Dyke,* no. 93. Commander Islands: Bering Island, *Stejneger,* no. 27.

Var. villosa (Pers.) Lehm. Fig. 4. Often coarser: branches few–many-flowered, with the petioles, peduncles, bractlets, etc. densely glandular-villous: leaflets villous or densely sericeous, oblong-elliptic to narrowly obovate, rounded at tip, $\frac{1}{3}$–$\frac{3}{5}$ as broad as long; the terminal 3.3–9.4 (av. 5.6) cm. long, 1.4–3.1 (av. 2.2) cm. broad.— Stirp. Pug. ix. 44 (1851) and Revis. Pot. 74 (1856); Walp. Ann. ii. 483 (1851–52); Wolf, Mon. Pot. 76 (1908); Robinson & Fernald,

Rhodora, xi. 48 (1909); Fernald & Wiegand, Rhodora, xii. 140 (1910). *Pentaphyllum palustre rubrum, crassis, & villosis foliis* Pluk. Phyt. t. ccxii. f. 2 (1692). *Comarum palustre, β. villosum* Pers. Syn. ii. 58 (1807); Rydb. Mem. Dept. Bot. Columbia Univ. ii. 163 (1898) and N. A. Fl. xxii. 355 (1908). *C. tomentosum* Raf. Aut. Bot. 170 (1840).—Reported but apparently rare or of doubtful status in Sweden, Ireland, Iceland and Greenland (see notes above), and Germany and Hungary (records questioned by Wolf, Mon. Pot. 76). In North America definitely known from the following stations. Quebec: Alright Island, Magdalen Islands, *Fernald, Long & St. John,* no. 7619. Nova Scotia: near Pictou, *Howe & Lang,* no. 478. Maine: Princeton, *Fernald & Wiegand* (*Fernald,* no. 1920); Moose Island, Passamaquoddy Bay, *Fernald & Wiegand* (*Fernald,* no. 1921); Marshfield, *Kate Furbish;* Merchants' Island, Hancock Co., *N. T. Kidder;* Readfield, *Kate Furbish.* New York: Wellesley Island, Jefferson Co. (transitional form), *Robinson & Maxon,* no. 9; Chatauqua Co., *M. S. Pettit.* Minnesota: Lake Kilpatrick, Cass Co., *C. A. Ballard;* Fort Snelling, *E. A. Mearns.* Manitoba: Lake Winnipeg Valley, *Bourgeau;* Cartwright, *W. Scott* (acc. to Wolf). A specimen from Port Ludlow, Washington (*F. Binns*) strongly approaches var. *villosa* but is hardly typical.

Explanation of Plate 106.

Fig. 1. Typical leaf of *Potentilla palustris,* after Svensk Botanik, t. 310. Fig. 2. Leaf of extreme form of *P. palustris* with narrow leaflets (*Comarum angustifolium* Raf.) from Ione, Washington (*Kreager,* no. 427). Fig. 3. Leaf of var. *parvifolia* from Dutch Harbor, Unalaska (*Van Dyke,* no. 93). Fig. 4. Leaf of var. *villosa* from Princeton, Maine (*Fernald,* no. 1920.)

FLORA OF THE SANDY RIVER VALLEY IN MAINE.

Clarence H. Knowlton.

The Sandy River is a tributary of the Kennebec, in western Maine. It rises in the central part of Franklin County, with two main branches. One of these originates in a string of small ponds lying in Sandy River Plantation, and receives tributaries from Letter E and No. 6. The other branch rises in Redington, receiving many brooks from Mt. Saddleback in Madrid. The river is about fifty miles long, flowing southeast from its sources through Phillips, Avon, Strong and Farmington; then turning to the northeast it flows through New Sharon between Stark and Mercer, then through Stark into the Kennebec,

two or three miles below Madison. Some of the sources are at least 3500 feet above the sea. At its mouth it is only 190 feet above sea-level.

I have never visited the Sandy River Ponds, but I have explored several of the mountain brooks which are near the beginnings of the river. These are mostly noisy torrents and trout-brooks, full of huge rounded boulders and gravel, with only occasional specimens of *Conioselinum chinense, Sium cicutaefolium* and clumps of sedge (*Carex torta* and *C. lenticularis*), to differentiate their flora from that of the surrounding woods.

From Phillips to New Sharon, some thirty miles, the river is a graded stream, with numerous meanders, broad intervales, ox-bow cut-offs and splendid terraces. These terraces are of sand and gravel above Farmington, with more clay below. Farmington village lies in part on the remnant of an old sand-plain, formed as a delta at the head of a marine estuary in the Champlain epoch, although its altitude is now 440 feet.[1] Nearly half of this sand-plain has been carried away by the river. Most of this work was probably done by the swollen stream which flowed from under the retreating glacier in the last days of the glacial period, when the ice was fast disappearing from the valley. Erosion has undoubtedly quickened greatly during the last 125 years, since the intervales were cleared of the forest. Terraces of equal height are visible on both sides of the valley in many places, showing the original height of the glacial and post-glacial deposits. Their material is closely stratified.

In summer the river is low and has little erosive power. Its gravelly beaches are covered in many places by *Apocynum cannabinum* and *Prunus pumila,* the two most common species. *Salix cordata* and *S. lucida* form immense clumps on this gravel, their height from a few inches to several feet. In sandy places there are tufts of *Panicum tennesseense.* Where the sediment is clayey it is easy to find *Ranunculus Flammula,* var. *reptans, Juncus nodosus* and *J. filiformis.* Clumps of *Carex torta* are occasional.

Perhaps the most characteristic habitat of this part of the valley is the alluvial thicket, which lines the shore in many places. The American elms are everywhere here, usually scattered, but very numerous. They are also the handsomest trees of the intervales,

[1] George H. Stone, The Glacial Gravels of Maine and their Associated Deposits, Monographs U. S. G. S. XXXIV, Plate II, page 484, etc. 1899.

adding a graceful beauty to the scenery. *Acer saccharinum* is abundant in the thickets, often reaching out over the river, and people call it the *river* maple. It bears the first flowers of spring, for that other harbinger of spring, the skunk cabbage, I have never found in the valley, although it flourishes along the Androscoggin, less than fifteen miles away. *Populus balsamifera* is frequent, and there are numerous willows — *Salix cordata, S. lucida, S. rostrata,* a little of *S. sericea* and near the villages, many staminate trees of *Salix alba,* var. *vitellina. Tilia americana* is not rare, and there are many other forest trees here and there, for when the first settlers came the intervales were mostly covered with hardwood forest.

On the edges of these thickets are such shrubs as *Alnus incana, Corylus rostrata, Cornus stolonifera,* and more rarely, at Farmington, *C. Amomum. Prunus virginiana* is exceedingly common, and almost always fruits heavily. The cherries are large, and in August as they ripen, are very handsome. I have never seen them so well developed anywhere else. Among the herbaceous plants in such places may be mentioned *Lilium canadense, Heracleum lanatum, Eupatorium urticaefolium, Helianthus decapetalus* in great abundance, *Aster macrophyllus* var. *ianthinus, A. paniculatus, A. umbellatus* and *A. punicens,* and much less frequent, *Conioselinum chinense* and *Angelica atropurpurea.*

There is also a wonderful growth of lianes, binding everything herbaceous and frutescent into almost impenetrable masses. *Vitis vulpina, Psedera vitacea, Clematis virginiana, Polygonum Convolvulus, Apios tuberosa* and *Convolvulus sepium* are the most vigorous of these. Near Farmington there are occasional strands of *Echinocystis lobata,* evidently escaped, and two vigorous thickets of *Celastrus scandens,* which I have seen only in one other place in the region — on Day Mt., at an altitude of 1000 feet or more.[1]

Inside these thickets, where the trees are taller, may be found *Laportea canadensis, Boehmeria cylindrica, Onoclea Struthiopteris* and *O. sensibilis, Elymus canadensis, Panicum clandestinum, Muhlenbergia foliosa, Bromus altissimus* and large quantities of *Veratrum viride.* Where the alluvial soil is of the finest sand, with but little humus, there are fine colonies of *Circaea intermedia,* a delicate but distinct shade plant which is well worth the finding. At Farmington I have found in these shady places *Carex cephaloidea* and *C. longirostris,* the

[1] Rhodora, VI, 208, 1904.

latter otherwise a complete stranger to the region. At Phillips I have found *Milium effusum* in woods like these, though I have elsewhere found it only in rich woods on mountain slopes.

The intervales have all been cleared, and are in grass-land or under cultivation. Their fertility is assured by occasional spring freshets, and the first farms settled were along the river. The cultivated fields bring forth the usual introduced weeds, but in the mowing-fields there are a few vigorous native species which compete successfully with herdsgrass and red-top. One of these is *Rhus Toxicodendron,* here a prostrate vine with yellowish-green foliage, which runs out from thickets and fence-rows everywhere, making the haying season a most dangerous time for the farmer who is not immune. This is the only form of poison ivy in the region. *Asclepias syriaca, Equisetum arvense* and *Vicia Cracca* are also very common in the grass. *Onoclea sensibilis* is everywhere, and is so vigorous that in a few years it will drive out the "English grass," even on the upland. After haying, when the first fronds have been cut, new fronds grow which are frequently to be classified as var. *obtusilobata.* This is the first plant to feel the frost, and on the morning afterward the air is everywhere fragrant from the chilled fronds. In spring the moister places are yellow with *Barbarea vulgaris.* Sandy places bring forth *Smilacina stellata,* and at Farmington there is one good station for *Pedicularis canadensis,* which shuns the firmer soil of the upland. I have never seen it north of this place.

The ox bows and cut-offs which the river has deserted are locally called "creeks." They are full of moisture-loving species, but so many of these plants are found in wet places all over New England, that I shall mention only a few of the more interesting. *Onoclea Struthiopteris* fringes many of these creeks, and is often five feet tall. *Glyceria* is very well represented, by *G. borealis* and four other species. *Zizania aquatica* is at two places in Farmington, so near the railway as to suggest its introduction from the outside world. *Carex retrorsa* is very common, and in one place I found this summer several plants of var. *Hartii.* This variety has smaller spikes than the type, with long drooping peduncles, and spreading perigynia. Prof. Fernald assures me that this plant is new to Maine, the nearest reported station being in western New Hampshire. At Strong there is a fine station for *C. Tuckermani,* and another for *Scirpus debilis. S. Torreyi* and *S. pedicellatus* are occasional, while *S. atrocinctus, S. rubrotinctus,*

S. georgianus and *S. cyperinus*, var. *pelius* are common. In *Sagittaria latifolia* there are all possible variations. In one place the leaves vary from wide to narrow with the depth of the water. *S. arifolia* also grows in these creeks. *Sparganium diversifolium*, var. *acaule* is rather common, as well as the much larger *S. americanum*. *Cicuta bulbifera* produces one umbel of flowers, but does not ripen seed, relying on a numerous crop of bulblets instead. *Lysimachia terrestris*, however, has both seeds and bulblets in abundance. One of the prettiest color schemes I saw last summer was a dry creek-bed filled with this plant and *Mimulus ringens*, both in flower. *Steironema ciliatum* is another handsome plant, when at its best.

The dry sandy banks of the river, and the similar terraces which arise from the intervales are paradises for *Solidago*. The handsomest kind is *S. squarrosa* which is everywhere abundant, a tall vigorous plant with a wand of large heads. *S. hispida* is a very common species in the region, while the closely related *S. bicolor* is infrequent. Other species are *S. juncea, S. nemoralis, S. serotina, S. canadensis, S. graminifolia* and a little of *S. puberula*. *Cuscuta Gronovii* is often parasitic on these goldenrods, especially near the river. *Apocynum androsaemifolium, Oenothera biennis* and various forms of *O. muricata*, with other coarse plants thrive in this loose water-washed till. *Apios tuberosa* and *Vitis vulpina* are also frequent in such places.

Wooded terraces have a soil full of humus, which is much richer. Here are found some of the forest trees, especially *Tilia americana, Acer saccharum, Populus grandidentata* and a very few trees of *Quercus rubra*. *Amelanchier laevis* is frequent where the terrace meets the intervale. In spring there are handsome beds of *Sanguinaria canadensis* here, with *Erythronium americanum, Dentaria diphylla* and *Viola scabriuscula*. A little later come *Smilacina racemosa, Pyrola asarifolia* (rare) and *Osmorrhiza Claytoni*. *Amphicarpa monoica, Desmodium canadense* and *D. acuminatum* represent the *Leguminosae*, but the two latter I have not found above Farmington. Interesting grasses are *Hystrix patula* and *Oryzopsis racemosa*. Summer and fall flowers include *Circaea Lutetiana, Solidago latifolia, Aster cordifolius, A. lateriflorus*, var. *hirsuticaulis, A. macrophyllus*, var. *ianthinus* and *Eupatorium urticaefolium*. Even in winter the stiff stems of *Equisetum hyemale*, var. *affine* may be seen sticking up through the snow.

One day the past summer I went ten miles downstream from Farmington to New Sharon, following the stream into Somerset county,

into the towns of Mercer and Stark. I expected to find a continuation of the flora above described, but it proved to be very different. The river flows through a plain laid down in the Champlain estuary. There is a big fall at New Sharon, below which the Sandy has cut a channel through 10 to 40 feet of alluvial overwash and estuarine clays to the ground moraine, and in a few places to the metamorphic bed-rock. The Sandy River thus flows in a high-walled channel over boulders, with coarse, shingly beaches. It is here about as large as the Deerfield at Hoosac Tunnel, or the White River just above its mouth.

Along the shore are several species which I have never seen up-river. There is a good deal of a low non-fruiting *Equisetum* which seems to be *E. littorale.* It is frequent on the St. John and the Penobscot, but so far as I know, has not been reported on the Kennebec. *Cyperus strigosus* appears for the first time, in limited quantity, and there is everywhere a great deal of *Rynchospora glomerata. Carex vulpinoidea* I had not missed up-river till I found it here. Clumps of *Deschampsia caespitosa* are very numerous. *Stellaria longifolia, Cicuta maculata* and *Lycopus virginicus* are also new to the region. In Stark I found a fine colony of *Habenaria flava* flourishing in wet gravel. This has been found in Chesterville, about fifteen miles from here, by Miss Eaton,[1] but I do not know of any other station for it. In the drier places above the shingle *Andropogon furcatus* crowds out all other species where it grows, and it occupies large areas of light soil above the banks. Where there is light shade I found *Danthonia compressa* in some abundance. I have found one or two specimens only of this at Farmington. Another good find was *Hypericum punctatum.* Along a tributary brook under the alders the ground was densely carpeted with *Leersia virginica,* to the exclusion of other species.

The dry woods covering the terraces and fringing the few intervales were especially interesting. *Acer saccharinum* is infrequent and small, as it is not adapted for such dry soil. Its place is taken by *Tilia, Quercus rubra, Juglans cinerea, Populus tremuloides* and *Fraxinus pennsylvanica* in all sizes. *Prunus virginiana* is still abundant. Lianes were not vigorous, and much to my surprise, I found no traces of *Celastrus.* In an open place in sand I found *Trisetum spicatum,* which I had found only at Phillips, 30 miles up stream, on ledges.

[1] L. O. Eaton, Rhodora V, 82–3, 1903 (As *H. virescens* Spreng.).

There were also clumps of *Agropyron caninum.* To me, however, the best find of the day was *Phryma Leptostachya* in Mercer, where it grew in dry alluvial woods with *Circaea Lutetiana.*

As this single day below New Sharon secured me fourteen species I had never collected in the region before, I feel confident that further exploration of the lower river will bring to light many other interesting plants.

Ranunculus septentrionalis is a frequent plant on many of the New England rivers, and I am considerably at a loss as to its scarcity along the Sandy. I have found it only once by the river at Farmington. It grows in one place on a tributary at least a mile from the river, and I found it in a clayey ditch at Stark, well back from the river. It seems to be very rare. *R. repens* I have found well introduced at Farmington and New Sharon.

In closing, I will mention the few genuine aquatics which I have found in the river. There are quiet reaches in its lower and middle course, and in such places *Isoëtes echinospora,* var. *Braunii* is common. *Nymphaea microphylla* is occasional, and there are several species of *Potamogeton.* Of these I have identified *P. amplifolius, P. dimorphus, P. bupleuroides* and *P. epihydrus.* The water in the creeks is stagnant, and often dries up completely, so they do not furnish a desirable habitat for aquatic plants.

For the convenience of any who are interested in the region, I add the following list of Rhodora articles about Franklin County plants.

Eaton, Lillian O.: Orchids of Chesterville, V, 82, 1903; Plants of Chesterville, IX, 207, 1907; Plants of Chesterville, XI, 30, 1909.

Jewell, H. W.: Notes on Some Ferns of Franklin County, IV, 247, 1902.

Knowlton, C. H.: On the Flora of Mt. Abraham Township, I, 191, 1899; On the Flora of Chesterville, II, 123, 1900; Flora of Mt. Saddleback, V, 35, 1903; On the Flora of Day Mt., VI, 206, 1904.

Hingham, Massachusetts.

ORONTIUM IN BARNSTABLE COUNTY, MASSACHUSETTS.

John Murdoch, Jr.

Mention was made at the June meeting of the New England Botanical Club by Mr. F. S. Collins of a specimen of *Orontium aquaticum* which he had collected for the club herbarium in Provincetown. This reminded the writer of an earlier collection of his own in the same town, and led him to look up the records of the species on Cape Cod. There are in the club herbarium specimens of E. and C. E. Faxon, from Truro, August 13, 1890, and of Charles A. Davis, from Provincetown, September 28, 1912. In the Gray Herbarium is a duplicate of the Faxon specimen, and no others from Barnstable County. The only other specimen from southeastern Massachusetts is one of C. H. Morss, from Middleboro. On a Decoration Day trip to Provincetown in 1904, the writer collected flowering specimens. In June, 1913, he collected fruiting material, and in August, 1913, made further observations, in the same region. *Orontium* thus seems to be rather an uncommon plant in this section, and a few notes on its habits might not be out of place.

Practically the whole of Provincetown consists of sand dunes. For a mile or more back of the village there is a low forest growth made up largely of pitch pine and oaks. The hollows among these wooded dunes are occupied by shallow ponds, some of which dry out completely during the summer. In four out of the six or seven seen by the writer, *Orontium* is very abundant. Up to the middle of June, it is the only conspicuous aquatic in these ponds. Later in the season water lilies and rushes also appear in considerable quantities. At blossoming time, in the latter part of May, the yellow spadices stand up plainly above the water, well warranting the common name of Golden Club, and the leaves are also well developed. By the middle of June, the fruit is ripe. The spadices have now bent over, leaving only occasionally an arch above the surface. The leaves, contrary to the description in the Manual, stand erect like those of the Pickerel Weed. Indeed, I have at a distance mistaken both *Orontium* for *Pontederia*, and the reverse. At the end of August, the fruit has practically disappeared. In the dry ponds, the leaves stand stiffly over the mud, while the roots are buried deep in the sand beneath.

It is a curious fact that in the ponds where the Golden Club occurred, no Pickerel Weed could be found, while in all the others it was abundant.

In one small pond between North Truro and Truro, I saw from the train a few plants of *Orontium*, but it occurs in none of the ponds which I have visited in Orleans and the eastern part of Brewster. There must be other stations for this plant on the Cape. Possibly the superficial resemblance of the leaf to that of *Pontederia* has led to its being overlooked. Future collectors in this region should examine localities like those in Provincetown — shallow ponds, with a layer of muck covering the sandy bottoms.

Newtonville, Massachusetts.

Scirpus occidentalis and Aster ptarmicoides in Connecticut. — In early September, 1912, I accompanied Dr. Charles C. Godfrey on a collecting trip in northwestern Connecticut, where we expected to see some of the rare or local species made known by the records of several preceding resident or transient botanists. In this our hopes were amply realized. But it is the purpose now to record two species not before recognized in the state.

During a brief interval between torrential rains which beset us during several days, we examined a bit of shore at Beardsley's Pond, in Sharon, and there found *Scirpus occidentalis* (Wats.) Chase in full fruit. High water made collecting difficult but we succeeded in hooking off a small supply of tops.

In the present year, on July 5, we again stopped at the Pond, finding the plants plentiful and apparently destined to fruit freely. The same morning and on the day preceding we had seen an abundance of the same species growing in shallow water at Twin Lakes, in Salisbury — acres of it. Here, after much search, we found a few panicles bearing some immature but characteristic fruit while the great mass of it was, and remained, unfertilized, presenting a peculiar appearance. Dr. Godfrey found very little fruit during August and early September.

The water of Twin Lakes is strongly impregnated with lime which may have been an important reason for lack of fertility although the plants appeared to be of normal luxuriance, at least, if an average of 5–6 ft. out of water coupled with a submergence of 1–2.5 ft. represents thrift.

While these two stations are but few miles apart the strains appear to differ slightly. All, however, agree in their resemblance to most western material in their tendency to short rays and spikelets, the latter sometimes congested, and in the very slightly viscid scales. Our no. 5889 from Bay of Islands, Newfoundland (1908) is of similar characteristics, all thereby differing materially from most northeastern specimens. Furthermore, fruiting spikelets rarely exceeded 1 cm. in length and were occasionally only half that, or shorter with 3–4 achenes. It should be mentioned that *S. validus* or other ally of similar habit was not observed in either station.

The occurrence of *S. occidentalis* also in eastern Massachusetts would indicate its presence elsewhere in Connecticut, at least in northern districts.

This particular area of Connecticut consists largely of limestone, much of which is exposed. In the southwest drainage basin of two such hills, Tom and Miles Mountains, in Salisbury, we found in 1912 a few nicely flowering specimens of *Aster ptarmicoides* T. & G.— plainly out of place in the edge of a swamp. This year we found the species plentiful on the hills themselves, particularly the first mentioned, growing in dry soil on the slopes, ledges and about the edge of the cliffs. So far as we have learned its southernmost record in New England has been long known as S. Hadley, Massachusetts.— Edwin H. Eames, Bridgeport, Connecticut.

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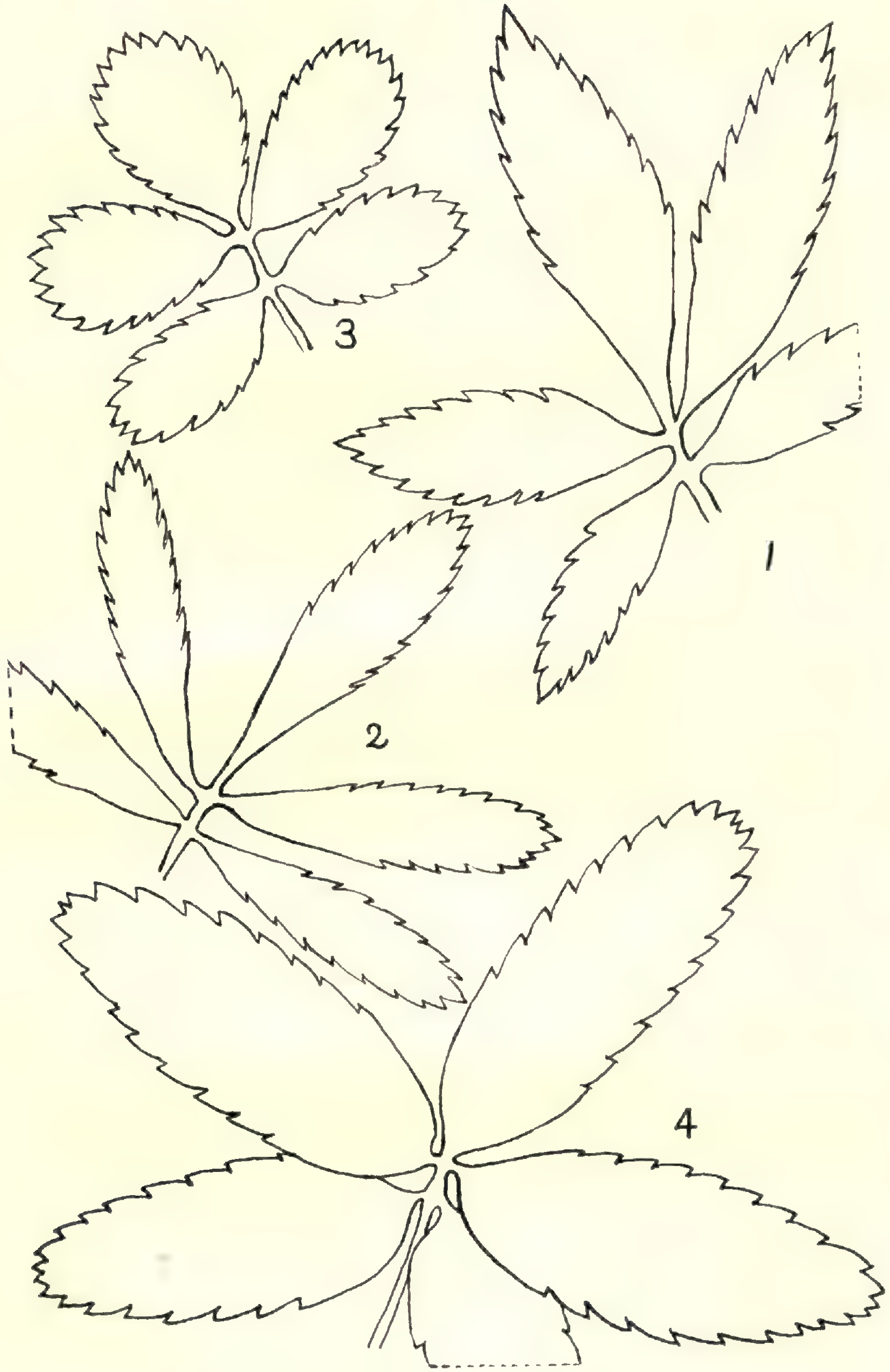

Leaves of Potentilla palustris and Varieties.

Rhodora

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THE ALPINE BEARBERRIES AND THE GENERIC STATUS OF ARCTOUS.

M. L. Fernald.

To those who are familiar with the flora of Canada it has long been known that there are two shrubs passing as *Arctostaphylos alpina;* one, the typical form of the species, with black or purplish-black pulpy strong-flavored berries; the other with more juicy and milder scarlet berries. Though not recorded in North America until 1852, the red-berried shrub was well described from Siberia as early as 1769. In his *Flora Sibirica,* J. G. Gmelin described the shrub from three districts, representing the full breadth of Siberia: "in the region of the Kutschakou mines among the Verkouturie chain" of the Ural Mountains (in northwestern Siberia near the Russian border); "on mountain barrens about the Olakminsk fortification" (on the Lena River northeast of Lake Baikal); and "in the hills of Ochotsk at the mouth of the Marecan River." These plants were listed as *Arbutus caulibus procumbentibus, foliis rugosis serratis* of Linnaeus's *Flora Lapponica,* which is the black-berried *Arctostaphylos alpina;* but in his description Gmelin said that the berries are "red . . . with abundance of juice and an insipid taste."[1] The first record of the scarlet-fruited shrub in North America was apparently by Sir John Richardson, who, in the enumeration of the trees and shrubs of British America, wrote of the Alpine Bearberry, *Arctostaphylos alpina* (L.) Spreng. (*Arbutus alpina* L.): "there are two varieties, one

[1] "In regionem *Kutschakouensis* fodinae intra catanem montium *Verchoturensium* et in sterilibus montasis intra *Olecmense* munimentum, vt et *Ochotii* ad *Marecani* fluuii ostium in collibus occurrit. Baccas magnas habet, rubras, . . . succi plenas, gustuque fatuas." — J. G. Gmel., Fl. Sib. iv. 119 (1769).

with bright red and more juicy fruit; the other, having a dark purplish-black berry, of more fleshy consistence, and a stronger peculiar flavor. Both are eaten in the autumn; and, though not equal to some of the other native fruits, are not unpleasant. The two kinds are exactly alike in foliage."[1] In 1884, Professor John Macoun wrote: "Both Hooker and Gray state that the berries of this species are black, on the contrary, those on specimens obtained on Anticosti and the Rocky Mountains [of Canada] are bright red."[2] In 1901, Britton & Rydberg, in an enumeration of plants from Yukon, after listing specimens (as *Mairania alpina*) add: "The red-fruited form collected also by Tarleton below Selwyn River";[3] in 1902, Miss Eastwood, enumerating the plants of Nome City, Alaska, described the material as having "leaves thin, deciduous, . . . surface smooth . . . .fruit a red, juicy berry"[4] and added the comment: "The berries which were collected and preserved in formalin may not be ripe. According to the descriptions they are black when ripe"; in 1907, Miss Farr, in her *Catalogue of the Flora of the Canadian Rocky Mountains and the Selkirk Range,* after listing stations at Banff, on Mt. Sulphur, at Field and in the Yoho Valley, said: "The drupes are a bright, clear red in color";[5] and in the same year Mr. Stewardson Brown, in his *Alpine Flora of the Canadian Rocky Mountains,* describes the shrub (as *Mairania alpina*) as having "leaves thin . . .berry bright scarlet."[6]

But through all this period the scarlet-fruited plant, treated merely as a color-form of the polar *Arctostaphylos alpina,* received no name. Very recently, however, in the enumeration of woody plants from western China, *Plantae Wilsonianae,* Rehder & Wilson have set off the shrub as *Arctous alpina,* var. *rubra,*[7] distinguished in the diagnosis merely by its red fruit, but with a supplementary note that "the leaves of the red fruited variety, both in the Asiatic and American specimens, are thinner and larger, while those of the typical form are smaller and of firmer texture."[8] The specimens cited by them are the

[1] Richardson, Arctic Searching Expedition, 433 (1852).

[2] Macoun, Cat. i. 294 (1884).

[3] Britton & Rydberg, Bull. N. Y. Bot. Gard. ii. 179 (1901).

[4] Eastwood, Bot. Gaz. xxxiii. 209 (1902).

[5] Farr, Contrib. Bot. Lab. Univ. Pa. iii. No. 1, 61 (1907).

[6] S. Brown, Alp. Fl. Can. Rocky Mts. 214, 215 (1907).

Rehder & Wilson treat the name *Arctous* as masculine but Niedenzu, who first took up the name (originally coined without explanation of its origin by Gray for a section of *Arctostaphylos*) for the genus, treated it as feminine, and it seems proper in such a case to follow the decision of Niedenzu.

[8] Rehder & Wilson, Pl. Wils. pt. iii. 556, 557 (1913).

type, *Wilson* no. 4025 from western Szech'uan in China, and two of Rehder's collection from near Banff and near Laggan, Alberta; but three of the above references to red berries in America (including Macoun's note on the Anticosti shrub) are given and the conclusion drawn that, "It seems to be the common form of western North America" and "The plant of eastern North America has bluish black fruit like that of Europe." The record from Anticosti clearly indicates, however, that the shrub is not strictly of "western North America" but occurs also near the easternmost margin of the continent; and in studying the plant as a member of the flora of eastern America the writer has found that, besides the characters indicated by Rehder & Wilson, the scarlet-berried shrub has several others which are of greater import and mark it as a well-defined second species of the section *Arctous*, a group of *Arctostaphylos* heretofore considered monotypic.

Briefly, the differences between *Arctostaphylos alpina* and the scarlet-berried plant are as follows. In *A. alpina* the persistent inner scales of the winter-buds are obovate and rounded at summit; in the scarlet-berried plant ovate or lanceolate and acuminate: in *A. alpina* the leaves are very rugose, subcoriaceous and marcescent, their margins, especially toward the base and on the petioles, ciliate with stiff bristles 1–2 mm. long; in the other shrub the leaves are less rugose, thinner, and more or less definitely deciduous, their margins without definite cilia, the usually longer petioles glabrous or at most minutely pilose-ciliolate at base: in the black-berried plant the seeds are 2.7–4.6 mm. long, 2–3.6 mm. wide; in the red 2.5–3 mm. long, 1.6–2.2 mm. wide: the black-fruited shrub is, in America at least, primarily if not always a shrub of acid or noncalcareous rocks; the red-fruited both with us as well as in China a plant of limestones.

That *Arctostaphylos alpina* in eastern America is a shrub of acid or noncalcareous habitats is well-known to those whose explorations have extended from New England to Labrador. The specimens and records of exact stations in eastern America, west of Greenland, make this apparent: Cape Prince of Wales, Hudson Straits, "where the rocks were found to be chiefly coarse, red granitite-gneiss";[1] Cape Chidley or Chudleigh, where "the rock everywhere consists of ordinary varieties of gneiss";[2] Nachvak, Labrador, where the "mountains . . . .

[1] Low, Geol. Surv. Can., Ann. Rep. n. s. xi. 372 (1899).
[2] R. Bell, Geol. and Nat. Hist. Surv. Can. Rep. of Progr. for 1882–'84, 18 DD (1885).

proved to be mostly Laurentian gneiss";[1] Hopedale, Labrador, its rock "of the ordinary Laurentian gneiss . . . with veins of quartz and of granite";[2] Indian Harbor, Labrador, with "hills . . formed of a pale whitish foliated syenite";[3] Battle Harbor, Labrador;[4] L'Anse au Loup and Blanc Sablon, Labrador, with their lowlands of Laurentian gneiss;[5] Barred Island and Baccalieu Island and Twillingate, Newfoundland;[6] open granite crests, Mt. Steepmore, Newfoundland; open granitic ledges, Mt. Musgrave, Newfoundland; Laurentian uplands back of Balena, Newfoundland; crests of Huronian hills, Miquelon; La Tabatière and Mécatina, Saguenay Co., Quebec, in the gneissoid region of the "North Shore";[7] crests of hornblende schist, Flagstaff Peak, Mt. Albert, Quebec; Traveller Mt., Maine, "composed of a beautiful drab colored siliceous slate";[8] Mt. Katahdin, Maine; and the White Mts., New Hampshire.

The preference for calcareous soils of the scarlet-berried plant is clearly indicated also by the Canadian stations from which it is definitely known: Anticosti Island, composed of Silurian rocks, chiefly limestones;[9] Fort Churchill, Hudson Bay, with its areas of Silurian and Cambro-Silurian limestones;[10] Jaspar House, Alberta, at the base of a conspicuous limestone mountain;[11] Bow River Pass (including Banff, Sulphur Mt., and Laggan), Alberta, where "The rocks composing the mountains on both sides of the valley are almost entirely of the limestone series";[12] Kicking Horse Pass (including Field), British Columbia, with "rocks referred to the great limestone series coming down to the level of the bottom of the valley";[13] Yoho Valley (North Fork, Cross River), British Columbia, where "the limestones, both in the bottom of the valley and so far as could be

[1] R. Bell, l. c. 14 D D (1885).

[2] Packard, Lab. Coast, 206 (1891).

[3] Packard, l. c. 171 (1891).

[4] "We pass Outer Battle Island and the 'Two Sisters,' bare, low islands of nearly white gneiss." — Packard, l. c. 137 (1891).

[5] See Packard, l. c. 116–118 (1891); also Fernald, RHODORA, xiii. 121 (1911).

[6] All in the sandstone, diorite and serpentine region of Notre Dame Bay (See Howley's geological map).

[7] See Logan, Can. Geol. 287 (1863).

[8] C. H. Hitchcock, Prelim. Rep. Nat. Hist. and Geol. Me. for 1861, 403.

[9] See Logan, Geol. Can. Chaps. x and xii.

[10] See Tyrrell, Geol. Surv. Can., Ann. Rep., n. s., ix. 167, 168 F (1897).

[11] "Roche Miette, a notable landmark . . . stands on the east side of the Athabasca a few miles below Jaspar Lake" and is composed chiefly of limestone — See McEvoy, Geol. Surv. Can., Ann. Rep., n. s. xi. 29D and Pl. 1 (1900).

[12] G. M. Dawson, Geol. Surv. Can., Ann. Rep., n. s., i. 134 B (1886).

[13] Dawson, l. c. 139B (1886).

observed, to the tops of the adjacent mountains, have become changed to marble";[1] below Selwyn River, Yukon;[2] Cape Nome, Alaska.[3] Of the three Siberian stations of Gmelin two are definitely located on a geological map of Siberia, Olakminisk and Ochotsk, both in "Paleozoic" areas; and, most important of all, the type station in western China is "by the side of a stream rich in calcareous deposits."[4]

Differing from the black-berried shrub in such essential characters:— the narrower and pointed inner scales of the winter-buds, the thinner and more elongate, more deciduous leaves without the characteristic bristly ciliation, the juicier scarlet berries and the smaller seeds, as well as its usual if not absolute restriction to calcareous soils; the scarlet-berried shrub has abundant claims to specific separation. Before formally transferring it, however, it is necessary to look into the generic name which it should bear. Its black-fruited relative of Eurasia and our northern and alpine granitic, gneissoid and siliceous areas was called by Linnaeus *Arbutus alpina*, but by practically all subsequent botanists has been treated as generically distinct from *Arbutus*, which has a many-seeded berry.

The generic name *Arctostaphylos* Adanson (1763), though very inadequately defined, has been almost universally used for *A. alpina* (L.) Spreng. (1825) and for *A. Uva-ursi* (L.) Spreng. and its allies, but recently Mr. F. N. Williams[5] has revived the Clusian and Tournefortian *Uva Ursi* on the basis of its post-Linnean use by Miller in the Abridgement of the Gardener's Dictionary in 1754, nine years before the publication of the generic name *Arctostaphylos*. The name or names, *Uva Ursi*, altered by Mr. Williams to *Uva-ursi* and by some others to *Uva-Ursi* has promptly been taken up by several authors to displace *Arctostaphylos;* but as Mr. B. Daydon Jackson well points out: "The proposed use of *Uva Ursi* for *Arctostaphylos* is excluded by analogy: Linnaeus (Phil. Bot. 160 (1751)) says:— 'Nomina generica ex duobus vocabulis integris ac distinctis facta, e Republica Botanica releganda sunt. . . . [e. g.] Vitis idaea T. *Vaccinium*.'"[6] Not only is the name *Uva Ursi* excluded by analogy and

[1] Dawson, l. c. 116B (1886).

[2] The writer has been unable to learn with definiteness the rock at this station.

[3] On the latest geological map of North America much of the Seward Peninsula, including Nome, is indicated as Paleozoic.

[4] Rehder & Wilson, l. c.

[5] F. N. Williams, Journ. Bot. xlviii. 183 (1910).

[6] Jackson, ibid. 206 (1910).

by the consistent practice of the "Botanical Republic," but the International Rules specifically cover the case in Article 54. "Names of genera must be rejected in the following special cases: . . . 3. When they are formed of two words, unless these two words were from the first united or joined by a hyphen." Miller, and before him Tournefort and Clusius, neither joined the two words by a hyphen nor united them into a single word but wrote with absolute clearness: Uva Ursi. The name *Arctostaphylos* will, then, continue to be used by those who follow the International Rules.

The taking up of the two unhyphenated words *Uva Ursi,* altered to a compound word *Uva-Ursi,* as has been done by some advocates of the "American" Code, seems to be in violation of the rule in that Code which says: "The original orthography of names is to be maintained, except in the following cases; . . . . (*a*) Manifest typographical errors may be corrected. (*b*) Adjectival names of species and subspecies agree in gender with the generic name with which they are associated. (*c*) Generic names derived from personal names should be feminine, ... (*d*) In the cases of names proposed in works in which *v* and *j* were used as vowels or *u* and *i* as consonants they should be corrected to agree with modern usage." If this rule is really to be followed by its advocates it is difficult to see how such an altered generic name as "*Uva-Ursi*" is allowable when the "original orthography" of Miller, and Tournefort before him, and Clusius before him, was uniformly the two words *Uva Ursi* or Bear's Grape.

Of late several botanists have been treating the Alpine Bearberry as belonging to a monotypic genus under the name *Mairania* Necker, Elem. Bot. i. 219 (1790), but, as Rehder & Wilson (*l. c.*) point out, *Mairania* was purely synonymous with *Uva Ursi* Tournefort and by neither Necker nor Desvaux, who took up the name, was used to distinguish the Alpine Bearberry as such. The type of *Mairania* is *Arctostaphylos Uva-ursi* (L.) Spreng. as is clearly shown by Necker's statement: "Quaed. Arbut. *Linn.* Uva ursi *Tournef.*" Necker was simply reinstating Tournefort's *Uva Ursi* as a genus under a monomial generic name and separating it from *Arbutus* with which Linnaeus had merged it, saying: "*Hanc cum praecedente* [*Arbuto*], *confudit Linnaeus: utramque, meritò separavit Tournefortius, siquidem characterem diversum, monstrant tam fructa quâm numero seminum.*" Britton, in the 2d edition of the *Illustrated Flora*, keeps up *Mairania* for the Alpine Bearberry, ascribing it to Necker but dating it not from

Necker's own publication, as was done in the previous edition, but from Desvaux's *Journal de Botanique*, iii. 36, 292 (1813); but surely Desvaux's treatment gives no ground for generically separating *Arbutus* or *Arctostaphylos alpina* from *A. Uva-ursi*. In fact, it requires a far keener scent for nomenclatorial trails than the present writer possesses to follow Desvaux to any rational conclusion. Here is what Desvaux did. In the body of the volume he wrote:

"[p. 36] MAIRANIA ARCTOSTAPHYLOS, Adanson.

Calix minimus 5 partitus; corolla ovata, limbo parvo, 5 [p. 37, line 1] fido revoluto. Stamina, 10 inclusa; filamenta glabra, an- [line 2] therae longitudinaliter dehiscentes, et apicè non biperforatae; [line 3] bacca, 5 locularis, loculis monospermis. Sufrutices folia [line 4] alterna, flores axillares subracemosi.

[line 5] ARBUTUS, L.

[line 6] Calix minimus 5 partitus; corolla ovata, limbo parvo, 5 [line 7] fido revoluto, Stamina, 10 inclusa, filamenta villosa; an- [line 8] therae poro gemino apicè dehiscentes. Bacca 5 locularis, lo- [line 9] culis polyspermis. Frutices; foli alternans flores terminales [line 10] subracemosi.
line 11] 1. ALPINA, Desv. Arbutus alpina, L. Foliis rugosis ser- [line 12 ratis. Habitat in alpibus et pyrenaeis.
[line 13] 2. UVA URSI, Desv. Arbutus uva ursi, L. Foliis interrimis.]
[line 14] Habitat cum priore."

It is certainly evident that the two species, *Arbutus alpina* L. and *A. Uva-ursi* L., were here put under *Arbutus*, not *Mairania;* but, needless to say, by their real characters they both *belong* under Desvaux's definition of "MAIRANIA ARCTOSTAPHYLOS" with "bacca, 5 locularis, loculis monospermis."

In the Errata, on page 292, Desvaux attempted some sort of a disentanglement, saying:

"Page 36, avant-dernière ligne, *lisez* ARBUTUS, L.
—— 37, ligne 5 ARBUTUS, Lin., *lisez* MAIRANIA, Neck. *Arctostaphylos*, Adans.
—— *Id.* ligne 11, *lisez* MAIRANIA ALPINA.
—— Id. ligne 12 [should have been 13], *lisez* MAIRANIA UVA URSI."

But this simply made a bad matter worse, for, after making the correction, we get the many-seeded *Arbutus* described as having "Bacca, 5 locularis, loculis monospermis," and the genus *Mairania* or *Arctostaphylos*, with its characteristic drupe with few nutlets, described "Bacca 5 locularis, loculis polyspermis"; and under this mangled generic description we get two species: "1. MAIRANIA ALPINA, Desv. *Arbutus alpina*, L." with its few nutlets, and "2. M. UVA URSI, Desv.

Arbutus uva ursi L." which commonly has its few nutlets fused into 1 stone. This publication of Desvaux's was obviously a hopeless piece of blundering, but, even if one can infer what he might have said if he had written otherwise, there is nothing in it to indicate the slightest tendency to separate *Mairania* from *Arctostaphylos* Adans. nor to treat *Mairania* or *Arctostaphylos alpina* as belonging to a separate genus from *M.* or *A. Uva-ursi.*

But even if the chance (i. e. alphabetical) placing of *M. alpina* before *M. Uva-ursi* in Desvaux's ill-begotten enumeration of the two can possibly mean to followers of the "American" Code that Desvaux was thus setting up a genus *Mairania* including the Alpine Bearberry as opposed to the common lowland Bearberry, it is impossible to see how the "American" Code allows *Mairania* to be taken up in this sense on the basis of Desvaux's publication in 1813 when the name had already been used by Necker in 1790 for *Uva Ursi* of Tournefort; for there can be no question that Tournefort's *Uva Ursi* was the common Bearberry. Tournefort clearly indicated this when he wrote: "I know one species of Uva Ursi (Uvae Ursi speciem unicam novi)," and when he illustrated the fruit with 5 coherent nutlets.[1]

Rehder & Wilson follow Niedenzu, in Engler, Bot. Jahrb. xi. 180 (1889), in using for the Alpine Bearberry the name *Arctous* which was the name given by Gray (*Synoptical Flora*) to a section including *Arctostaphylos alpina* as contrasted with the other species. If the genus *Arctous* is to be maintained it should be under that name; but its claims to generic rank seem to the writer, as they have to many others, extremely trivial and such as even the most extreme devotees of change have not yet ventured to apply to parallel cases in many other genera, such as *Vaccinium*, *Ilex* and *Rubus*. The fullest definitions of *Arctous* (*Mairania* Britton, not Necker) as opposed to *Arctostaphylos* ("*Uva-Ursi*") seem to be those of Drude in Engler's *Pflanzenfamilien* and of Britton in Britton & Brown's *Illustrated Flora;* and, since these emphasize essentially the same points, the English descriptions are here quoted.

Arctostaphylos. "Erect or spreading, low or tall shrubs (some western species small trees). Leaves alternate, petioled, firm or coriaceous, persistent, evergreen. Flowers small, nodding, pedicelled, white or pink, in terminal racemes, panicles or clusters. Clayx 4–5-parted, persistent. Corolla globose, ovoid, urceolate or oblong-campanulate, 4–5-lobed, the lobes recurved, im-

[1] See Tourn. Inst. 598, t. 370 (1700).

bricated in the bud. Stamens 10, rarely 8, included; filaments short, subulate; anthers short, erect, introrse, with 2 recurved awns on the back, the sacs opening by a terminal pore. Disk 8–10-lobed. Ovary 4–10-celled; ovules solitary in the cavities; style slender. Fruit a drupe, with 4–10 seed-like nutlets coherent into a solid stone."

Arctous ("Mairania")... "A low shrub, with shreddy bark, alternate thin deciduous leaves clustered toward the ends of the branches, and small white clustered pedicelled flowers. Calyx 4–5-parted. Corolla 4–5-toothed, the short teeth spreading or recurved. Stamens 8 or 10, included; anther-sacs with 2 recurved dorsal awns. Ovary 4–5-celled; ovules 1 in each cavity. Drupe globose, with 4 or 5 separate 1-seeded nutlets." [1]

The description of *Arctous* ("*Mairania*") is briefer than the other, but it seems to contain only these strongly contrasting or by inference opposing characters: *Arctous* "with shreddy bark, . . .thin deciduous leaves" as opposed to *Arctostaphylos* with character of bark not stated, leaves "petioled, firm or coriaceous, persistent, evergreen"; and *Arctous* with nutlets separate as opposed to *Arctostaphylos* "with 4–10 seed-like nutlets coherent into a solid stone." The key states these points concisely:

"Nutlets coalescent; leaves persistent.	19. *Arctostaphylos*
Nutlets separate; leaves deciduous.	20. *Mairania*."

Some others, Drude [2] for instance, add to these characters the juicier pulp of *Arctous* as contrasted with the more mealy pulp of *Arctostaphylos*. Niedenzu,[3] on the other hand, bases his "generic" distinction chiefly on the anatomical structure of the leaves, *Arctostaphylos Uva-ursi* and others (with the exception of *A. glauca* which is allowed to remain in *Arctostaphylos*) having a more or less dense coat of pubescence on the leaves ("Deckhaare vorhanden"), *Arctous* having glabrous leaves ("Deckhaare fehlen"), etc.

If all these contrasting characters, ascribed by one person or another to *Arctous* as opposed to *Arctostaphylos*, would only exhibit themselves in nature as they do on paper the genus *Arctous* would have much to commend it; but unfortunately not one of the weightier characters stands three minutes' test in a representative herbarium. The shreddy bark, for example, of the trailing branches of *Arctostaphylos* (or *Arctous*) *alpina* is so like that of *Arctostaphylos Uva-ursi* that only after long practice could the two be distinguished by the bark.

[1] Britton in Britton & Brown, Ill. Fl. ii. 572 (1897).
[2] Drude in Engler & Prantl, Pflanzenf. iv. Ab. 1, 49 (1889).
[3] Niedenzu in Engler, Bot. Jahrb. xi. 178, 179 (1890).

In some way the statement has become a fixture in many of the American and European descriptions, that the leaves of *Arctostaphylos* (or *Arctous*) *alpina* are "thin and deciduous." But surely such a statement would never knowingly be made by anyone who, like the writer, has many times tramped over miles of barrens carpeted with the Alpine Bearberry and has eaten quarts of its bitter-sweet berries in the hope of growing to like them. *Arctostaphylos* or *Arctous alpina* certainly *does not* have deciduous leaves! On the contrary they are marcescent, losing their freshness during the winter and persisting, often for many years, as masses of bleached and alternately dry and wet foliage. So persistent are these old leaves, that in collecting the shrub for the herbarium it is necessary to tear off a large proportion of the old foliage in order to display the branches and the newer shoots. That the spick-and-span branches artificially depleted of all old leaves, such as one often finds in the herbarium, should lead to an impression that the leaves are deciduous is not unnatural, but this *post mortem* and wholly artificial character cannot be maintained as generically separating *Arctous* from *Arctostaphylos*.

This observation, that the leaves of *Arctostaphylos* or *Arctous alpina* are marcescent, not deciduous, is abundantly verified by the statements of others who have an intimate acquaintance with the growing shrub. Thus we find in Koch's *Synopsis*: "*foliis*...glabris, basi integerrimis ciliatisque marcescentibus";[1] in Ledebour's *Flora Rossica:* "foliis...glabris basi integerrimis subciliatis marcescentibus";[2] while Blytt in his *Norges Flora* goes into more detail: "the leaves wither in winter and remain withered during the next summer (Bladene visne om Vinteren og sidde visnede igjen næste Sommer)."[3]

In the somewhat less coriaceous or even membranous leaves *Arctostaphylos* or *Arctous alpina* certainly differs from all the other members of the group, except the red-berried plant described as *Arctous alpina*, var. *rubra*, and in their glabrous leaf-surfaces these two differ from all other species of the group except *Arctostaphylos glauca;* but the texture and degree of pubescence of leaves surely cannot alone differentiate a genus.

The other really strong character (on paper) is the statement that in *Arctostaphylos* we have "4–10 seed-like nutlets coherent into a

[1]Koch, Syn. ed. 3, pt. 1, 412 (1857).
[2]Ledeb. Fl. Ross. ii. 908 (1844–46).
[3]Blytt, Norg. Fl. i. 839 (1861).

solid stone," while in *Arctous* there are "4 or 5 separate 1-seeded nutlets." This statement in regard to *Arctous* is unquestioned; but what are the demonstrated facts in regard to *Arctostaphylos*? In *Arctostaphylos Uva-ursi* the nutlets are commonly more or less fused, but anyone who will take the trouble to examine the ripe fruits of a large series of specimens can see for himself that on occasional plants there are fruits which, when pressed between the thumb and first finger or under the thumb-nail, quickly crush into 5 distinct nutlets! If he is keenly enough interested to examine other species, for example *A. pungens* HBK., one of the commonest of Manzanitas, he will have the same experience. In both these common plants and in many other species of *Arctostaphylos* he can find fruits with all the nutlets coherent, with some of them coherent and others free, or with all of them distinct. This again is not merely the writer's observation: it belongs to that common store of knowledge which a very slight study of the literature of the group (to say nothing of the specimens) quickly brings into prominence. Thus, in the *Botany of California* the section including most of the Manzanitas is described: "the stones commonly separate or separable, at least some of them, not rarely some of them united or 2-celled and 2-seeded";[1] in the *Synoptical Flora of North America* the section *Uva-ursi*, containing *Arctostaphylos Uva-ursi, tomentosa, pungens*, etc., is said to have "its nutlets separate or separable, or irregularly coalescent."[2] Jepson, dealing only with the Manzanitas (true *Arctostaphylos*) says: "Nutlets distinct, irregularly united in 2s or 3s, or sometimes consolidated into a single stone,"[3] and Abrams, dealing with the Manzanitas of southern California, says: "Ovules solitary in the cells, which become bony nutlets or combine into a few-several-celled stone,"[4] and describes *Arctostaphylos Manzanita* with "nutlets irregularly separable," *A. tomentosa* with "nutlets all separate or some united in pairs," and *A. Pringlei* with "nutlets consolidated into a rough carinate stone, or separable." The maintenance of *Arctous*, then, because its nutlets are separate, as opposed to *Arctostaphylos* with nutlets coalescent, is as artificial as its maintenance because of "deciduous" leaves.

There remains the one absolute fact, that in *Arctostaphylos* the pulp

[1] Gray in Brewer & Watson, Bot. Cal. i. 452 (1876).
[2] Gray, Syn. Fl. ii, pt. 1, 27 (1886).
[3] Jepson, Fl. W. and Mid. Cal. ed. 2, 312 (1911).
[4] Abrams, Fl. Los Angeles and Vic. 291 (1904).

of the fruit is dryish and unpalatable, in *Arctous* juicier and to some people not wholly unpalatable; but, according to Richardson, *Arctostaphylos alpina* has the "dark purplish-black berry of more fleshy consistence, and a stronger peculiar flavor" than the "one with bright red and more juicy fruit" (*Arctous alpina*, var. *rubra*). Surely, if *Arctous alpina* can be generically separated from *Arctostaphylos* by its "deciduous" leaves, its distinct nutlets, and its juicier pulp, the scarlet-berried shrub, with thinner and nonciliate leaves sometimes really deciduous, and with still more juicy fruit, has just as strong claims to generic separation from the black-berried *A. alpina* with marcescent thickish and more rugose ciliate leaves, and fruit "of more fleshy consistence."

From this analysis of the frail characters pushed to the front by those who urge the generic separation of *Arctous* (*Mairania* of Britton, not Necker) it is apparent that they are not only trivial but largely nonexistent, and that no sound reason has yet been advanced for the separation of the section *Arctous* as a genus.

The scarlet-berried shrub, which led to this exposition of a typical case of the elevation to generic rank of long-known and already closely studied sections and subgenera, the sort of hasty change that some people consider "progressive," may be called, then, by the scarcely distinctive name

Arctostaphylos **rubra** (Rehder & Wilson) n. comb., rami prostrati, cortice brunneo in lamellas secedente, ramulis adscendentibus; bracteis interioribus persistentibus gemmarum lanceolatis vel ovatis acuminatis; foliis membranaceis deciduis vel paullo marcescentibus planis vel rugosis glabris, laminis oblanceolatis vel cuneato-obovatis 1.3–4.5 cm. longis 0.6–1.6 cm. latis crenatis eciliatis basi integris apice obtusis vel acutis, petiolis pallidis 0.5–1.5 cm. longis glabris vel minute piloso-ciliolatis; baccis coccineis vel rubris succulentis, seminibus 5 distinctis 2.5–3 mm. longis, 1.6–2.2 mm. latis.

Stems prostrate, covered with a loose brown bark exfoliating in thin layers; branchlets ascending: inner persistent bracts of the buds lanceolate or ovate, acuminate: leaves membranaceous, deciduous or slightly marcescent, flat or rugose, glabrous; the blades oblanceolate or cuneate-obovate, 1.3–4.5 cm. long, 0.6–1.6 cm. wide, crenate, not ciliate, entire at base, the apex obtuse or acute; petioles pale, 0.5–1.5 cm. long, glabrous or minutely pilose-ciliolate: berries scarlet or red, succulent; seeds 5, distinct, 2.5–3 mm. long, 1.6–2.2 mm. wide.—*Arbutus caulibus procumbentibus, foliis rugosis serratis*, J. G. Gmelin, Fl. Sib. iv. 119 (1769), not L. Fl. Lapp. *Arctostaphylos alpina* (red-fruited variety or form) Richardson, Arct. Search. Exped. 433 (1852);

Macoun, Cat. Can. Pl. i. 294 (1884); Eastwood, Bot. Gaz. xxxiii. 209 (1902); Farr. Contrib. Bot. Lab. Univ. Pa. iii. No. 1, 61 (1907). *Mairania alpina* (red-fruited form) Britton & Rydberg, Bull. N. Y. Bot. Gard. ii. 179 (1901); S. Brown, Alp. Fl. Can. Rocky Mts., 214 (1907). *Arctous alpinus* [*a*], var. *ruber* [*ra*] Rehder & Wilson, Pl. Wils. pt. iii. 556 (1913).— Calcareous soils, Siberia and western China; in North America known from Alaska, Yukon, British Columbia, Alberta, Keewatin, and Quebec (Anticosti Island). For citation of stations see pages 21, 22, 24 and 25.

Gray Herbarium.

SYSTEMATIC STUDIES ON OENOTHERA,— IV. OE. FRANCISCANA AND OE. VENUSTA, SPP. NOVV.

Harley Harris Bartlett.

(Plates 107 and 108.)

The allies of *Oenothera Hookeri* form an especially difficult group from a systematic standpoint. In as much as they are open-pollinated forms and range throughout most of the far West from Oregon and Washington to Mexico, the chances are great that numerous spontaneous hybrids exist. Although the writer has had a number of forms related to *Oe. Hookeri* in cultivation during the last three years, it has been very difficult to arrive at any conclusion in regard to specific lines in the group. Aside from the more narrow-leaved forms one of which probably represents the true *Oe. Hookeri* T. & G., the cultures have included two very satisfactorily distinct new species, which can be safely characterized at this time. One of them, *Oe. franciscana*, has been cultivated by the writer through three generations. The seeds were taken from a packet accompanying a herbarium specimen which was collected July 30, 1905, at Carmel Beach, Monterey County, California, by Prof. C. P. Smith, of the Maryland Agricultural College, (*C. P. Smith* 1063, in herb. Bartlett.) They were planted in the open in the spring of 1910. Since the species is rather persistently biennial unless the seeds are started during the winter in the greenhouse, the plants failed to mature during the first season. One plant, however, bore in the axil of a rosette leaf, a single precocious flowering branch

from which seeds were obtained for a small culture (10 plants) which was started early enough so that it flowered normally during the summer of 1911. The culture of 1910, from the wild seeds, also flowered in 1911 and was identical with the F_1 generation. The same plant, which had flowered precociously in 1910, flowered again in 1911, and was self-pollinated. From the self-pollinated seeds of this plant a second F_1 of ten plants was grown in 1912. One of them, No. 6_{10}–6_{12} in the writer's garden at Bethesda, Maryland, served as one parent of reciprocal crosses of which the other parent was a plant of true *Oe. biennis* L. in the garden of Prof. B. M. Davis at the University of Pennsylvania. The same parent plant, which was used for the crosses, was self-pollinated to continue the pure strain. In 1913, fifty plants were brought to maturity in the garden of the Bureau of Plant Industry at Glenn Dale, Maryland, and Davis grew the hybrids with *Oe. biennis*, as well as a considerable number of plants of the pure strain, at Philadelphia. Prof. Davis also had a culture of *Oe. franciscana* from wild seed collected by Miss Alice Eastwood in San Mateo County. Since all the cultures, from both sources, have been reasonably uniform, there is no reason to doubt that the species is a relatively stable type with a geographic range of considerable extent. The species has received its name from the fact that the material thus far seen has come from central California, the area covered by Greene's Flora Franciscana.

The name *Oenothera venusta* is proposed for a species from the more southern part of California. Two varieties of it have been cultivated, differing from each other by the absence in one of a hair type which occurs in the other. It is obviously impossible to affirm that either variety is the parent form from which the other has been derived. In this case, however, and whenever a similar situation arises in the future, the writer will proceed on the hypothesis that the variety in which a character is absent is the derivative form, and the specific diagnosis will be drawn up to cover only the hypothetically older form. The varietal descriptions need then cover contrasting characters only. If a true specific diagnosis were drawn up to include all the varieties of the species, it would become necessary to define and name separately the "var. *typica*" of each species. Such a course would be logical, but in the present unsettled state of our knowledge of the relationships of the Oenotheras it seems undesirable to introduce any names which can be dispensed with. Consequently the diagnosis of the *Oe. venusta*

has been drawn up to cover only one variety; the other is described as *Oe. venusta* var. *grisea.*

The typical form of *Oe. venusta* was grown from seeds collected by S. B. Parish at San Bernardino, California, Sept. 16, 1912. Var. *grisea* was collected by F. M. Reed (No. 358) at Riverside, Cal. The writer's cultures of 30 plants of each were very uniform, and the forms are described after only one generation of cultivation. Cultures of both were also grown during the past summer by Prof. B. M. Davis, at Philadelphia.

Oenothera franciscana sp. nov. Biennis. Rosula matura 4–5 dm. diametro, foliis anguste oblanceolatis, maximis modice bullatis, ca. 25 cm. longis, 3.5–4 cm. latis, utrinque molliter pilis subappressis arcuatis tectis, apice acutis, basi in petiolum attenuatis, margine infra mediam distanter sinuato-dentatis, apicem versus solum denticulatis, denticulis callosis. Planta matura 5–8 dm. alta, deorsum cum ramis 10–15 caule proprio fere aequilongis ex foliorum axillis rosulae prodeuntibus, sursum vel simplex et usque ad inflorescentiae basin solum ramulos brevis rosulatos ferens vel infra inflorescentiam ramosa. Rami infimi saepe ramosi. Caules teretes virides pilis triformibus vestiti; I, pilis 2–3 mm. longis patentibus verrucosis acutis basi rubrotuberculatis; II, aliis similibus sed multo brevioribus absque tuberculis rubris; III, paucissimis laevibus minutis ampulliformibus. Folia lanceolata, majora ca. 15 cm. longa, 3.3 cm. lata, utrinque molliter cum pilis acutis verrucosis pubescentia, brevipetiolata, apice acuta, margine distanter sinuato-denticulata. Inflorescentiae simplices laxae. Bracteae persistentes, inferiores foliis valde similes late divergentes vel deflexae, fructibus ascendentibus fere ter longiores; superiores basi obtusae vel rotundatae fructibus vix longiores, extus pilis aliis clavatis laevibus apice rotundatis viscidis, aliis longioribus acutis eis foliorum similibus sed non verrucosis tectae, intus solum his indutae. Hypanthium ca. 45 mm. longum, basi 2.3 mm. crassum, superne modice dilatatum, pilis patentibus longis acutis sublaevibus vel inconspicue verrucosis cum aliis multo brevioribus laevibus clavatis intermixtis tectum. Calycis segmenta 38 mm. longa valde hirsuta, apicibus liberis 3.5 mm. longis terminalibus inter se appressis, ante explicationem gemmam basi 7–8 mm. diametro rubrotinctam formantia; pilis biformibus, I, multis clavatis laevibus et II, longioribus patentibus acutis laevibus basi rubrotuberculatis. Petala, ca. 36 mm. longa obcordata. Stigmata patentia stamina longe excedentia. Ovarium 11 mm. longum, dense pilosum, pilis aliis ascendentibus longitudine valde variantibus acutis verrucosis, aliis paucissimis minutissimis clavatis. Fructus maturus saepe 4.4 cm. longus sed plerumque multo brevior, quadrangulus prismaticus, 5–5.5 mm. crassus, apicibus valvulorum liberis (capsula dehisceta) erectis, 2.5 mm. longis truncatis. Semina 1–1.5 mm. longa, atrobrunea.— Seed

collected at Carmel Beach, Carmel-by-the-Sea, Monterey Co., California, *Chas. Piper Smith*, No. 1063.

Oenothera venusta sp. nov. Biennis. Rosula matura ca. 60 cm. diametro. Folia maxima 30 cm. longa, 6 cm. lata, modice infra mediam bullata, acuta, sinuato-denticulata, ad basin versus repando-dentata. Planta matura 13–15 dm. alta, basi ramis ca. 10 ex rosulae axillis prodeuntibus caule proprio aliquantum inferioribus, infra mediam ramulis brevibus 2–20 cm. longis haud floriferis nec rosulatis praedita; sursum ramos floriferos in spicas laterales inflorescentiae terminalis transgredientes gerens. Caulis teres pallidus purpurascens pilis paucis longis arcuatis basi rubrotuberculatis et aliis longitudine multo variantibus plerumque brevissimis sine tuberculo rubro tectus, omnibus valde verrucosis ad apicem versus angustatis sed apice obtusiusculis. Folia lanceolata vel fere obcuneata ca. 15 cm. longa, prope basin 2 cm. lata, superne gradatim angustata acuminata, vix undulato-denticulata, utrinque velutina et de pubescentiae causa pallide viridia, pilis uniformibus, pluribus brevibus arcuatis acutis inconspicue verrucosis. Inflorescentiae e spica terminali angusta laxa et spicis terminali similibus lateralibus constantes, ante anthesin strobiliformes, aetate bracteis ascendentibus, fructibus fere ad rhachin appressis. Bracteae persistentes, inferiores foliis parvioribus omnino similes, superiores sublineares vel subulatae acuminatae ovariis bis terve longiores, extus pilis clavatis laevibus apice rotundatis viscidis aliisque paucissimis longis acutis, intus solum pilis acutis laevibus non viscidis tectae. Hypanthium 40 mm. longum, basi 2.5 mm. crassum, apicem versus ad crassitudinem 3 mm. dilatatum, pubescentia ex pilis paucis longis curvatis ascendentibus et multis erectis clavatis viscidis constante. Calycis segmenta pallido-viridia, nondum expansa gemmam conicam subquadrangulam 36 mm. longam, basi 8 mm. crassam, cum apicibus liberis 4 mm. longis inter se appressis formantia, pilis biformibus eis hypanthii omnino similibus sed densioribus vestita. Petala obcordata ca. 42 mm. longa. Pistillum staminibus longius. Ovarium 10–11 mm. longum dense pilosa, pilis ascendentibus acutis verrucosis paucis longissimis multis brevissimis, nullis rubrotuberculatis. Fructus maturus conicus, subteres, 4-sulcatus, prope basin 7 mm. crassus, ca. 35 mm. longus, apicibus valvulorum liberis 1 mm. longis, truncatis vel obscure emarginatis. Semina 1.5 mm. longa, brunea.— Seed collected Sept. 16, 1912, by S. B. Parish, at San Bernardino, California.

Oe. venusta var. **grisea** var. nov. a forma typica differt bracteis hypanthio et calycis segmentis griseo-viridibus solum pilis acutis verrucosis tectis. Pili clavati apice rotundati viscidi in tota planta desunt.— Seed collected at Riverside, California. "Plant 358 from F. M. Reed." (B. M. Davis in lit.)

The interesting character which distinguishes *Oe. venusta* from its var. *grisea*,— the absence of viscid hairs in the latter, is possibly

Mendelian. Early in the morning the unopened flower buds of the two varieties look very unlike. The material (it seems to be a mixture of a sugar and a weak acid) which is excreted by the thin-walled clavate hairs of the typical form will have deliquesced, and each hair of this type is then tipped by a drop of viscid solution, sufficiently concentrated so that it has a decided taste. In this condition the buds are greener than when dry. The buds of var. *grisea*, on the contrary, have no secreting hairs and remain dry and gray. When wet by the dew, the droplets condensed on the pubescence have no taste. On a dry day the gross appearance of the buds of the two varieties is the same but they can be readily distinguished with a hand lens. In general, the viscid character of many Oenotheras (*Oe. Lamarckiana*, for example) is due to secretions from the thin-walled clavate hairs of the pubescence. The red (or green) tubercles at the base of some of the sharp thick-walled granulose hairs seem to have no secretory function.

The photographs of *Oe. venusta* var. *grisea* accompanying this article were taken under the writer's supervision in the garden of the Bureau of Plant Industry at Glenn Dale, Md., season of 1913. *Oe. franciscana* is being used for genetic studies and plants of the type strain will eventually be illustrated in that connection.

Bureau of Plant Industry, Washington, D. C.

Explanation of Plates.

Plate 107. *Oe. venusta* var. *grisea*, (above) mature rosette, (below) flowering plant.

Plate 108. *Oe. venusta* var. *grisea*, inflorescence and details.

In each figure the reduction may be calculated from the label, which is 10 cm. long.

SIX WEEKS' BOTANIZING IN VERMONT,— III.

NOTES ON THE PLANTS OF SWANTON AND VICINITY.

Sidney F. Blake.

The town of Swanton, where I collected from 16 to 30 August 1911, lies on the eastern shore of Lake Champlain about four miles below the Canadian border. Its extensive deposits of glacial sands and gravels of varying depth overlie a base of hard blue clay, and are cut here and there by masses of marble forming small hills. With the exception of a few rarities, the plants found here were much the same as those of the sandy plains about Essex Junction. In the following list of the more interesting species collected the asterisk marks those not previously recorded from the state. Altitudes are given in feet.

Osmunda cinnamomea L. f. incisa (Huntington) Gilbert. Damp woods, Swanton, 25 August.

O. cinnamomea L. f. latipinnula Blake. Edge of woods, alt. 120, Swanton, 20 August.

*O. regalis L. f. interrupta Milde, Monog. Osmund. 61 (1868). *O. regalis* var. *interrupta* Milde, Die Höher. Sporenpfl. 78 (1865).— Dampish ground, not long mowed, Swanton, 27 August (*Blake* 3177 part).— Fertile fronds fruiting in the middle, several terminal pairs of pinnae sterile and herbaceous, their pinnules often cut or lobed. Apparently always the result of mowing. Seen also from New Hampshire: Hampton Falls, 1899, *A. A. Eaton;* Massachusetts: Carlisle, 1882, *Dame;* Cambridge, 1862, *Gray;* Mansfield, 1907, *A. A. Eaton & C. W. Welch;* Stoughton, 1908, 1911, *Blake.*

L. tristachyum Pursh. Sandy woods, alt. 570, Fairfield.

Thuja occidentalis L. Observed on one occasion on plains of pure sand, an unusual habitat, in company with *Betula populifolia, Myrica asplenifolia,* and other plants normally of this habitat.

Sparganium americanum Nutt. Near shore of Fairfield Pond, Fairfield, alt. 550; the branched form.

S. diversifolium Graebn. Muddy shore of Missisquoi River, Swanton; damp ground, alt. 135, Swanton.

Sagittaria arifolia Nutt. Sand flats, St. Albans Bay.

S. heterophylla Pursh f. fluitans (Engelm.) Blake. Shore of Maquam Bay.

CYPERUS DENTATUS Torr. Shore of Maquam Bay.

C. DIANDRUS Torr. Bank of brook, alt. 115, Swanton, 21 August (*Blake* 2995).

C. STRIGOSUS L. f. CAPITATUS (Boeckl.) Blake. Dry sand, Swanton.

C. STRIGOSUS L. var. COMPOSITUS Britton. Shore of Maquam Bay, Swanton (*Blake* 2773, 2918).

SCIRPUS AMERICANUS Pers. Specimens taken on shore of Maquam Bay (*Blake* 3184) have a second divergent bracteal leaf 2.5 cm. long in addition to the normal upright one.

S. ATROVIRENS Muhl. f. SYCHNOCEPHALUS (Cowles) Blake. Clayey bank of Missisquoi River, Swanton; damp pasture, alt. 615, Prospect Hill, St. Albans; damp soil near brook, alt. 300, Swanton.

S. CYPERINUS var. PELIUS f. CONDENSATUS (Fernald) Blake. Common.

ERIOCAULON SEPTANGULARE With. Shore of Maquam Bay; shore of Fairfield Pond, alt. 550, Fairfield.

J. EFFUSUS L. var. SOLUTUS Fernald & Wiegand. Meadow, alt. 120, Swanton.

LILIUM TIGRINUM Ker. Along Central Vermont Railroad, St. Albans, 22 August.

BETULA ALBA L. var. MINOR (Tuckerm.) Fernald. A single tree, about eight feet high, found uprooted along the shore of Fairfield Pond, Fairfield, alt. 550, on 24 August (*Blake* 3105). The summit of Mt. Mansfield is the only other known locality in the state for this strongly marked variety.

P. AMPHIBIUM L. f. TERRESTRE (Leers) Blake. Damp woods near Charcoal Creek, Swanton; shore of Fairfield Pond, Fairfield.

RUMEX MEXICANUS Meisn. Central Vermont Railroad yard, St. Albans.

* ATRIPLEX PATULA L. var. HASTATA (L.) Gray. Railroad yards, St. Albans, 19 August (*Blake* 2966). New to the state, but clearly introduced.

* A. PATULA L. var. LITTORALIS (L.) Gray. Beach of Maquam Bay, L. Champlain, 18 August (*Blake* 2933). A plant of coastal and Great Lake range with us, now proving to occur also in the Champlain Valley like *Ammophila arenaria, Lathyrus maritimus,* and *Artemisia caudata.*

SALSOLA KALI L. var. TENUIFOLIA G. F. W. Mey. Three tiny plants, along Central Vermont Railroad, Swanton.

* Oxybaphus floribundus Chois. Along Central Vermont Railroad, Swanton, 18 August (*Blake* 2859). Determined by Mr. C. A. Weatherby.

* Erucastrum Pollichii Schimp. & Spenn. Two plants collected, Central Vermont Railroad yard, St. Albans, 22 August (*Blake* 3008). Second New England record; see Robinson, Rhodora xiii. 10 (1911).

Potentilla Anserina L. Along Central Vermont Railroad, alt. 395, St. Albans.

P. Anserina L. var. sericea Hayne. Shore of Maquam Bay.

P. monspeliensis L. var. norvegica (L.) Rydb. Pasture, alt. 600, Fairfield.

* Rosa spinosissima L. Pasture, alt. 675, Aldis Hill, St. Albans, 19 August (*Blake* 2938). Apparently new to the state.

* Spiraea salicifolia L. Forming thickets by roadside, alt. 260, Swanton, 24 August (*Blake* 3044). New to New England.

* Euphorbia glyptosperma Engelm. Sand along Central Vermont Railroad, Swanton, 25 August (*Blake* 3158). New to the state, but perhaps introduced.

Hibiscus Trionum L. A single plant, edge of lawn, St. Albans.

H. boreale (Britton) Bicknell. Shore of Maquam Bay; meadow along Charcoal Creek, Swanton; near shore of Fairfield Pond; meadowy ground, Swanton.

Myriophyllum tenellum Big. Shore of Maquam Bay.

Cicuta bulbifera L. Plants collected near shore of Fairfield Pond were freely bulbiferous and sparingly fruiting.

Gerardia paupercula (Gray) Britton. Gravelly beach, Maquam Bay; dampish sandy soil, Swanton, 25 August; meadowy ground, Swanton, 27 August.

G. tenuifolia Vahl. Clayey bank of Missisquoi River, Swanton, alt. 125.

Linaria minor (L.) Desf. Along Central Vermont Railroad, Swanton, 18 August (2860). It has been recorded from North Sheldon, only a few miles away (Rhodora xiv. 204 (1912)).

Lonicera tatarica L. Pasture, Aldis Hill, St. Albans.

Ambrosia trifida L. var. integrifolia (Muhl.) T. & G. Central Vermont Railroad yard, St. Albans.

* Bidens discoidea (T. & G.) Britton. Shore, Maquam Bay, Swanton, 20 August (*Blake* 2985). A species hitherto known as of coastal plain range from eastern Massachusetts southward and westward, whose occurrence in the Champlain Valley is of much interest.

* PRENANTHES RACEMOSA Mx. One or two plants along Central Vermont Railroad, Swanton, 25 August (*Blake* 3156). Perhaps introduced.

STOUGHTON, MASSACHUSETTS.

PLURALITY OF SEEDS IN ACORNS OF QUERCUS PRINUS.

CHARLES PIPER SMITH.

A LITTLE more than a year ago my colleague, Mr. B. W. Anspon, brought me an interesting acorn of the chestnut oak, *Quercus Prinus* L. Two hypocotyls were protruding from the apical end of this nut and dissection brought to light two perfect seeds. Mr. Anspon had been attracted by the large size of the acorns and was much surprised to find many of them with two sprouts in evidence. As he had never seen or heard of two-seeded acorns, he brought the matter to my attention.

My interest was aroused at once, both because of the size and weight of the nuts, and because my attention had been called, but a few days before, to a two-seeded acorn of *Q. alba* L. discovered by one of my students.

Following directions furnished by Mr. Anspon, I soon visited the locality of the chestnut oaks, two miles east of College Park, and found, presumably, the very trees from which came his specimens. I proceeded to collect all the two-seeded acorns I could find under the two trees and the final count gave the number of fifty-four. Several one-seeded nuts, almost as large as the two-seeded ones, were also collected, and four three-seeded ones added more interest to the case. Almost all the acorns had germinated at this date, Nov. 17th., the few unsprouted specimens found being evidently defective and incapable of germination. Many of the sprouting acorns were lying uncovered on the surface of the ground, though few thus exposed had the radicle penetrating the soil.

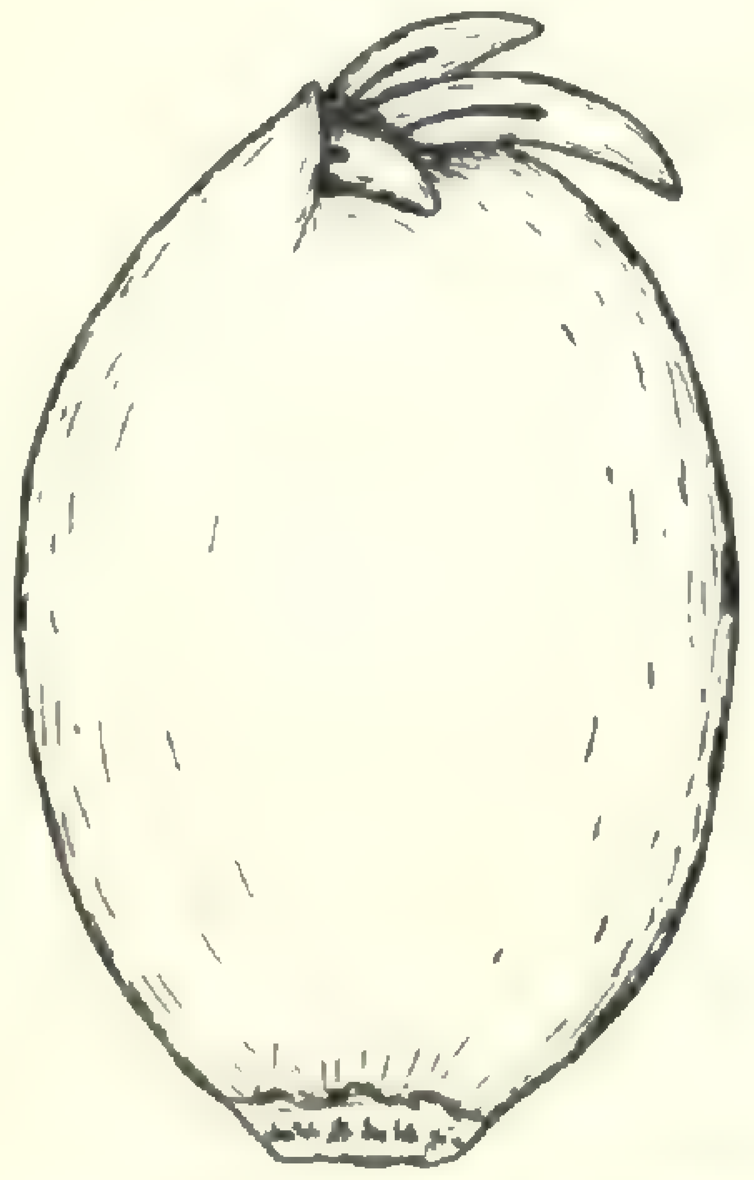

Fig. 1 A 3-seeded acorn with 3 hypocotyls emerging at apex.

One oak of another group of several trees furnished just two two-seeded specimens, the nuts of all these trees being more nearly average in size for the species and normal in other respects.

Two more two-seeded nuts were obtained, upon subsequent search, under the white oak from which came the one two-seeded acorn of that species mentioned above. Three out of over two-thousand nuts would evidently not attract attention except by pure accident; but with a possible 10% two-seeded, as in the case of the two chestnut oaks under our observation, one could not fail to notice some of the abnormal nuts upon giving any attention to the fallen crop.

Fig. 2. Two embryos from a 2-seeded nut.

In accordance with resolutions made last year, I again visited these same oak trees this November. I found, however, the acorn crop to have been very small this season, with apparently no abnormal fruits amongst the few acorns on the ground. In size, this year's nuts are much smaller than those of 1912. The only two-seeded acorns I have noticed this season have been three from another white oak on the Maryland Agricultural College campus, and one from a very small-fruited chestnut oak west of Beltsville, Maryland.

The commonly accepted characterization of the fruit of the beech family as a one-seeded nut may justify one in taking interest in the finding of so many two-seeded, and even a few three-seeded, acorns. I am prone to believe, however, that this abnormality is much more common with us than our records would indicate. In American literature I find but one reference in this connection, Mrs. E. G. Britton some time since, in the Bulletin of the Torrey Botanical Club, describing and illustrating a single white oak acorn in which were extra cotyledons and two radicles. European writers, however, deserve credit for making record of not a few cases of teratological fruits of Quercus, Penzig, in his "Pflanzenteratologie," quoting Stenzel as the recorder of many two- and three-seeded acorns of *Q. Robur* L., and

Fig. 3. A 2-seeded nut; sprouts on opposite sides, not at apex.

Masters, in his "Vegetable Teratology," supplying quite a paragraph upon the subject of "Plurality of embryos in Quercus."

Since the normal number of ovules in the oak ovary is six, it is not so very wonderful that more than one of these should occasionally be fertilized and mature into seeds, perfect in all their parts, though abnormal in shape. It does seem odd, however, that such a large number of these abnormal fruits should be produced by one or two trees at one time.

Maryland Agricultural College, College Park, Maryland.

THE NORTH AMERICAN REPRESENTATIVE OF ARENARIA CILIATA.

M. L. Fernald.

Arenaria **cylindrocarpa**, n. sp., perennis dense vel laxe caespitosa, ramis filiformibus humifusis, ramulis adscendentibus 1–15 cm. altis puberulis remote foliatis 1–4-floris; foliis imbricatis vel remotis lanceolatis vel oblanceolatis vel oblongis subacutis glabris carnulosis siccis obsolete uninerviis 2–10 mm. longis, axilis haud vel rare fasciculigeris; pedicellis puberulis 2–30 mm. longis; calyce cylindrico basi rotundato 3–5 mm. longo fructifero 2–2.5 mm. diametro, sepalis oblongis obtusis vel subacutis enerviis vel obsolete uninerviis ad capsulam arcte adpressis; petalis anguste oblongis 5–7-nerviis calycem vix aequantibus; antheris carneis; capsulis cylindricis calycem longioribus 4.5–5.5 mm. longis olivaceis vel brunneis; seminibus reniformibus 0.6–0.7 mm. longis brunneis nitidis obsolete rugulosis.

Perennial, densely or loosely caespitose; branches filiform, forming close creeping mats; branchlets ascending, 1–15 cm. high, puberulent, remotely leafy, 1–4-flowered: leaves imbricated or remote, lanceolate, oblanceolate or oblong, subacute, glabrous, thickish, when dry obscurely 1-nerved, 2–10 mm. long; the axils rarely if ever bearing small fascicles: pedicels puberulent, 2–30 mm. long: calyx cylindric, rounded at base, 3–5 mm. long, in fruit 2–2.5 mm. in diameter; sepals oblong, obtuse or subacute, nerveless or obscurely 1-nerved, closely appressed to the capsule: petals narrowly oblong, 5–7-nerved, barely equaling the calyx: anthers flesh-colored: capsules cylindric, exceeding the calyx, 4.5–5.5 mm. long, olive or brown: seeds reniform, 0.6–0.7 mm. long, brown, shining, obscurely rugulose.— *A. ciliata*, var. *humifusa* Robinson, Proc. Am. Acad. xxix. 292 (1894) and in Gray, Syn. Fl. i.

pt. 1, 240 (1895), not (Wahlenb.) Hartm. Skand. Fl. ed. 4, 141 (1843). *A. ciliata* Britton in Britton & Brown, Ill. Fl. ii. 31, fig. 1500 (1897), not L. Sp. Pl. 425 (1753).— On serpentine, rarely limestone, and possibly other rocks, Labrador, Newfoundland, Quebec and British Columbia. Labrador: Ramah, August 20–24, 1897, *J. D. Sornborger*, no. 126; near Hebron, *Mentzel*. Newfoundland: serpentine tablelands, altitude about 380 m., Bonne Bay, August 27, 1910, *Fernald & Wiegand*, no. 3354; serpentine and magnesian limestone barrens, northeastern bases and slopes of Blomidon ("Blow-me-down") Mountains, July 24, 1910, August 20, 1910, *Fernald & Wiegand*, nos. 3352, 3352*a*; "field," Serpentine (or Coal) River, July 16, 1896, *Waghorne;* dry limestone barrens, upper slopes and tablelands, altitude 200–300 m., Table Mountain, Port à Port Bay, August 16, 1910, *Fernald & Wiegand*, no. 3353. Quebec: crevices and talus of serpentine, altitude 700–1100 m., Mt. Albert, Gaspé County, July 26 and August 1 and 2, 1881, *J. A. Allen*, August 12, 1905, *Fernald & Collins*, no. 76 (type in Gray Herb.), July 23 and 25, 1906, *Fernald & Collins*, nos. 448, 449, 453. British Columbia: boggy slopes, Silver City, August 11, 1885, *J. Macoun;* "summit of Rocky Mountains," August 14, 1890, *J. Macoun*.

Confused by American botanists with *Arenaria norvegica* Gunn. Fl. Norv. ii. 144, no. MC, t. 9, figs. 7–9 (1772) = *A. ciliata*, var. *norvegica* Hartm. Skand. Fl. ed. 3, 105 (1838) = *A. ciliata*, var. *humifusa* Hartm. l. c. ed. 4, 141 (1843); also with *A. ciliata* L. Sp. Pl. 425 (1753); but differing from each of those European plants in many characters. In both *A. norvegica* and *A. ciliata* the leaves are more obviously nerved and even those of the flowering branches usually subtend small axillary fascicles, and in *A. ciliata* the leaves are strongly ciliate. In both *A. norvegica* and *A. ciliata* the calyx is campanulate to hemispherical, in fruit 3–4 mm. in diameter; and the sepals are oval, acuminate, and usually strongly nerved, those of *A. ciliata* often ciliate at base. In both the European species the petals are oval and distinctly longer than the sepals; and both have ebony-black seeds, those of *A. norvegica* coarsely rugose, of *A. ciliata* distinctly but more finely rugose.

Gray Herbarium.

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SOME FLESHY FUNGI OF STOW, MASSACHUSETTS,— II.

Simon Davis.

Since my former article[1] I have diligently followed my favorite pursuit and herein give some further results of my work. Much to my regret no less than four tracts of woodland that I have searched for twelve years past have been laid low by the owners thereof. The only tamarack swamp in the town was stripped of every tree during the winter of 1911–1912. I cannot help a feeling of regret as I recall my collections therein in days gone by of rare species of the series Hyporhodii.

Meteorological conditions have not improved until this fall of 1913. Between June 8 and September 1 of this year, less than .2 inch of rain fell in Stow. All summer crops either failed or gave the farmer a mere pittance for his expenditures of time and money. During September however rains were frequent and the precipitation nearly up to the monthly average and in October the rainfall was above the normal with consequences that made the heart of the toadstool collector leap with joyous expectancy. I have not seen so many nor such a variety of fungi in our woods since the fall of 1907.

As usual I began my search May first of each of the years 1911, 1912, 1913, and found many morels, especially during last May. It may be interesting to know that I find them frequently under the white ash. Best of all during May, 1912, I gathered two plants of *Gyromitra esculenta* Fr., not a common plant. I have found it just twice in twelve years. Dr. W. W. Ford of Johns Hopkins Medical School pronounced a portion of one of my plants non-poisonous.

[1] Rhodora, Vol. 13, pp. 57–66.

They were found in the middle of a road leading through pines. For the last three years I have found in a small swamp during May and June many plants of an interesting whitish Ascomycete, *Ombrophila clava* (A. & S.) Cooke. Its shape reminds me of a small copper rivet and I find it on dead leaves, often nearly or quite covered with water. The plant was identified by Prof. E. J. Durand.

I find during May and June a rare species of *Pholiota, P. mycenoides* Fr. It grows in sphagnum in company with *Galera sphagnorum* Pers. The stem is very long, slender, and brittle, and in my experience attached to the moss. It requires delicate handling if you wish to collect an entire plant.

I have found in four different places for years an occasional specimen of *Hypholoma rugocephalum* Atk. and many specimens of *H. delineatum Pk.* Both occur on decayed wood and resemble each other externally, but the latter may be separated from the former by its more narrow obtuse and smooth spores and by its broader flask-shaped cystidia. Dr. Peck notes the differences in N. Y. State Mus. Bull. No. 150, p. 83. Any collector who wishes to know the exact meaning of the word "rugose" cannot do better than to inspect very carefully the pileus of one of these fungi.

I continue to find yearly a few plants of *Pluteolus callistus* and *P. expansus* Pk. They are rare plants and when in good condition as beautiful as they are rare. Dr. Peck in his synopsis, N. Y. State Rep. No. 46, p. 59, bases his distinction between these two species upon habit, not a good distinction in my opinion and experience. This past summer I found two specimens of *P. expansus* growing on a decayed maple twig in an exsiccated water hole in a swamp. The spores of the two species are substantially alike.

During June and the early part of July I find quite a number of specimens of *Marasmius varicosus* Fr. Morgan does not include this species in his list of the North American Species of *Marasmius*.[1] Dr. Peck apparently has never seen the plant, for I fail to find any reference to it in his reports. The purplish-brown gills growing darker as they dry, and the stem covered with blackish-red down half way up are the chief characteristics of this remarkable species. August 7, 1911, I found many plants of *Lepiota cristatella* Pk., see N. Y. State Rep. No. 31, p. 31 and No. 35, p. 163. This plant bears a strong

[1] Journal of Mycology, V. 12.

external resemblance to almost all white *Mycenae* and is very rare; Peck says in the latter report: "The species has been detected but once." I found it in a tamarack swamp.

Both Dr. Peck and I were greatly puzzled to name the genus to which a plant belonged that I found first in 1910 growing upon and around a pile of decayed white birch. It had many of the characteristics of a *Collybia;* it looked like a *Mycena;* also bore some resemblance to an *Omphalia.* The doctor wrote January 11, 1911: "It hovers on the confines of *Collybia, Mycena* and *Omphalia,* and I think better be left till we can settle at least the genus." Finally he placed it in the genus *Omphalia* as *O. maura* Fr. I am not quite reconciled to this determination, having a strong predilection in favor of considering it a species of *Collybia.* It is a small plant variable in color and structure from water white to fuliginous and deeply umbilicate to even; it is without odor and of no pronounced taste.

September 16, 1913 I found very fine plants of what I consider *Armillaria ponderosa* Pk. It is a very noticeable plant because of the veil becoming lacerated and adhering in shreds to the stem and margin of the pileus. My plants were very light yellowish. See N. Y. State Mus. Rep. 43, p. 41.

Eccilia flavida Pk. was very common during 1912 and 1913. It varies very much in stature and color. It is smooth and slimy, and when seen after the gills have assumed the prevailing color of the genus presents a very pretty sight. The pileus is pale yellow, obscurely striate when dry and the stem is concolorous. I find it in swamps under deciduous trees, usually in great abundance.

August 4, 1913, I found two plants of one of the most interesting *Ecciliae* I have ever seen. Its especial claim to distinction lies in the peculiarity of the gills which are brownish-fimbriate and serrulate. I cannot find any species of *Eccilia* that agrees with my plant.

August 4–12, 1911, I found many plants of *Nolanea delicatula* Pk. It is well named, for it is delicate in appearance and must be handled with the utmost care if you wish to preserve it for future reference and comparison. It is entirely white and found in thickly wooded swamps. See N. Y. State Mus. Rep. 24, p. 66.

August 25–Sept. 6, 1913, I found many plants of what I believe to be a new species of *Nolanea.* It was growing upon decayed leaves in a swamp of deciduous trees in an exsiccated water hole. I made three collections; the last time I picked it from under the leaves, and was

enabled thereby to fix the genus as the margin was straight and from the first pressed to the stem, and not involute. A slight idea of its color may be had when I write that it reminded me of and I took it for *Hygrophorus psittacinus* Fr., because of its greenish color and shining appearance. But the plant is not a particle viscid, and its seemingly viscid character is wholly due to the fibrils of the pileus which appear as if glued to its surface resembling in this respect *Inocybe agglutinata* Pk. with which I have been familiar for ten years. The pileus is olive green with whitish streaks and the stem and gills are white. It is a pretty and very interesting species, and I am fortunate in having a good collection of specimens. September 7, 1911, I found a number of plants of a pink-spored Agaric that puzzled me. I thought it a species of *Leptonia.* But Dr. Peck pronounced it a new species and named it *Clitopilus leptonia.* See N. Y. State Mus. Bull. No. 167, p. 39. In Dr. Peck's letter to me he writes: "In some of the specimens the lamellae are distinctly decurrent. This species is allied to *Clitopilus vilis* Fr. and *C. subvilis* Pk., though resembling a *Leptonia.*" I found it again in 1912, but it did not appear in 1913. *Naucoria sphagnophila* Pk. is very common in one swamp, where it grows throughout the summer. The mature plant is noted for its minutely appressed tomentose and sometimes flocculose squamulose pileus of a grayish ochraceous or rusty brown color. It is a small plant the pileus seldom exceeding 2.5 cm. in breadth.

During November, 1912, I found in thick pine woods a pretty *Collybia* which Dr. Peck called new and named *C. truncata* because of its truncate pileus. It looks not unlike an *Entoloma* in situ and the reddish spots on the gills as they mature heighten the illusion; it has a long, reddish, creeping stem. In the same month I found another new *Collybia* called by Dr. Peck *C. subdecumbens.* The stem was in many plants up to 16.5 cm. long, straight above the oak leaves upon which the plants grew, but bent at a right angle where it penetrated the leaves, compressed in many plants and well covered with a white, hairy mycelium; many stems flatten out upon the leaves to which they are attached. The taste and odor remind one of a raw potato. The pileus is drab, the gills white, and the upper part of the stem satin white and shining. The entire plant presents with age a slightly scorched appearance. The last two species were found after severe frosts had visited Stow. For full descriptions see Mycologia for March, 1913, Vol. V, No. 2, p. 68.

In November, 1911, I found numerous and fine specimens of *Cortinarius pholideus* Fr. With my determination Dr. Kauffman our American specialist on this genus, agreed. It has not appeared since. I found it on high land under pines. It is distinctive because of its fawn colored pileus, which with the stem is squarrose with fuliginous-blackish scales. In the same piece of woods I found in October last fine plants of *C. duracinus* Fr. as they seemed to me. Upon sending them to Dr. Kauffman he reported, "The *Cortinarius duracinus* Fr. may be correct. I still have uncertainities as to what the genuine one is. In any case it agrees better with the Friesian species than the variety of it which occurs here (as well as in Sweden)." This opinion exhibits the professor's good judgment and careful study of this intricate genus. I consider this species remarkable because no trace of a fibrillose cortina has been observed in any stage of its growth. Such cortina as it has appears only as a silky narrow white zone around the very margin of the pileus. See Stevenson, British Fungi, Vol. 2, p. 54.

In October 1911, *Hygrophorus morrisii* Pk. was very common and very variable in size. I find it always under pines. It bears a very strong resemblance to *H. pustulatus* Fr., as noted by Dr. Peck, but is distinguished by the characters named by him. See Bull. Torrey Botanical Club, Vol. 26, p. 64. 1899. It was not seen during 1912 and 1913. In the summer of 1912, I found many specimens, very large and very small, very light and very dark, of *Hyrophorus nitratus* Fr. I found it by the roadside out of the shade, in the depths of a swamp entirely in the shade, and in situations where the sun reached it for a few hours of each day. The strong nitrous odor was always present. "Very changeable in stature according to locality," remarks Stevenson, Vol. 2, p. 91. During August of 1912 and 1913, I found a few specimens of *Hygrophorus peckianus* Howe, a curious plant on account of its change of color; when young and moist it is almost exactly the color of *Lactarius fuliginosus* Fr.; when dry and *passé* it is avellaneous and opaque. It recalls small faded specimens of *Laccaria laccata.* I have never detected any odor such as Howe noticed.

Of all agarics I have ever found the vilest in smell was one I collected in August, 1912, in a swamp and under a very large white oak. I consider it was *Clitocybe amara* Fr. or very near that species. The taste was very bitter and the odor disgusting and persisting for two days but fortunately it was not volatile. I regret that I have but one

specimen. *Clitocybe subnigricans* Pk. grew near the preceding plant. It is a plant that always suggests one of the *Tricholomata* as I look down upon it, but as Dr. Peck says in N. Y. State Mus. Bull. 150, p. 2, "A fine species easily distinguished by its strong odor and the blackening of the lamellae and stem where bruised and in drying."

Many of the common species of *Clavaria* are met with each season but I will mention only a few that are not common. *Clavaria similis* Pk. and *C. kromholzii* Fr. were found in August, 1911, in a swamp. In the fall of 1912, I found a plant conspicuous for its size and color which Dr. Peck determined as *C. obtusissima* Pk., N. Y. State Mus. Bull. No. 167, p. 39. *C. pallescens* Pk. I continue to find and this past season's collection developed a strong smell of sulphuric ether upon drying.

Many of the common species of the *Tricholomata* were abundant in October last. I refer in particular to *T. terreum* Schaeff., *T. equestre* L. and *T. portentosum* Fr. Of less common species I found in 1911, *T. fumidellum* Pk., *T. albobrunneum* Pers., *T. flavobrunneum* Fr. and *T. terraeolens majus* Pk. in thick pine woods on high land. This last plant I have reason to think is of wide range. It is a variety of *T. terraeolens* Pk., and is noted in N. Y. State Bull. 157, p. 52. It is a handsome plant.

Stow seems to me highly favored with genera and species of the *Hyporhodii* and *Dermini*. I find and collect more plants of these two series than of all the remaining series. In September, 1911, I found many specimens of *Entoloma flavifolium* Pk. They were much larger than Dr. Peck's illustration in N. Y. State Mus. Bull. 105, pl. S., deeper in color and the stem distorted in shape. September 13, 1911, I found fine plants of what Dr. Peck determined as *Entoloma fumosonigrum* Pk. The pileus has the color of *Lactarius lignyotus* Fr. It appeared in the same locus August 21, 1912, three weeks earlier than in 1911, but it did not appear in 1913; see N. Y. State Mus. Bull. 167, p. 42. August 27, 1912, I found a very distinguished, tense looking *Entoloma* which Dr. Peck determined as *E. mirabile* Pk. It is colored like *E. peckianum* Burt., but is stouter and larger. It did not appear in 1913. The season of 1913 brought to my notice in considerable quantity a marked variety of *E. salmoneum* Pk. I found about forty plants with a light greenish stem more highly colored at the base than at the top and many of them with pilei having greenish shades more or less deep. In all other respects they were typical plants. Each

season I find a few plants of *Leptonia flavobrunnea* Pk. originally found in Stow by the writer in 1908. The specific name fits this species admirably, for the gills are yellowish-brown. August 4–30, 1913, I found numerous specimens of a small *Leptonia* finally determined by Dr. Peck as *L. gracilipes* Pk. It grew very abundantly in and upon each side of a road leading through a large tract of mixed woods. The same month I found in swamp woods a number of plants of a species of *Leptonia* finally determined to be *L. validipes* Pk. It is a very straight, shining, steel-blue plant and grew upon and at the base of a pile of vegetable humus. It is a small but very handsome plant; for descriptions of the last two species see Mycologia, Vol. V., No. 2, pp. 69, 70.

Hebeloma discomorbidum Pk. was quite common during the fall of 1911. "In the dried specimens the center of the pileus has a brown or discolored appearance, as if beginning to decay. This is suggestive of the specific name." See N. Y. State Mus. Bull. 139, p. 75.

The genus *Inocybe* I must admit at once has a fascination for me only exceeded by the genus *Hygrophorus*. The species of the latter genus with few exceptions have been conspicuously absent from all my collecting grounds since 1908. On the contrary the species of *Inocybe* have loomed large for the past three years and I have tried to learn something about them from field observations, from my books, and under the guidance of Dr. Peck. At the outset let me say: "Unless you have and know how to use a microscope, drop this genus." You cannot do anything with the numerous species unless you resort to a microscope to learn the nature of the spores and the presence or absence of cystidia. Even then you will be face to face with many an obstacle that will try your patience. Herein I shall record little more than an enumeration of my collections. During the past three years I have found and collected *I. infelix* Pk., *umboninota* Pk., *hiulca* Fr., *diminuta* Pk., *asterospora* Quél., *trechispora* (Berk.) Karst., *castaneoides* Pk., *agglutinata* Pk., *rimosoides* Pk., *subochracea* (Pk.) Mass., *calospora* Quél., *eutheloides* Pk., *minima* Pk., *longispora* Pk., and *euthelella* Pk.

Unless otherwise stated all identifications of species mentioned were made by my good and very accommodating friend Dr. Charles Horton Peck, State Botanist, of Albany, N. Y., and such plants are in the N. Y. State Herbarium in said Albany. Many specimens also are in my possession, for I try diligently to find enough for correspondents

and myself, usually though not always succeeding. I think it a good plan to pick a solitary specimen if one deems it of sufficient interest to save while waiting for more. I make as good description as possible and then am the better prepared to recognize the plant upon a second meeting.

Brookline, Massachusetts.

ALLIES OF SOLIDAGO ODORA.

Albert Hanford Moore.

In 1881 Gray described a new species of Solidago, *S. Chapmanii*,[1] which had been confused with *S. odora* Ait.[2] The latter species was known to Plukenet and clearly illustrated in his works.[3] Michaux[4] distinguished an *S. retrorsa*, which is plainly a synonym of it, but his *S. odora*,[5] is generally considered an equivalent of *S. tortifolia* Ell.,[6] and perhaps correctly. It is certainly not *S. odora* Ait., nor any of the other species included in the key below. *S. lanceolata* Bosc[7] is nothing but a mechanical synonym. *S. odora* can be told from all its allies by the longer and strictly lanceolate or linear-lanceolate, usually thinner leaves.

The only other near relatives of *S. odora*, hitherto recognized, are *S. tortifolia* and *S. fistulosa* Mill.[8] In the former the lower leaves are distantly serrate, the involucres smaller (3.5–4 mm. high, about 2 mm. broad), and their scales very blunt and erose, which is true in no other species of the group. The leaves of *S. fistulosa* are crenate-serrate, with more or less numerous scattered hairs on the lower surface, while in *S. odora* and *S. Chapmanii* the leaves are entire and glabrous, except for the scabrous margin. In *S. tortifolia* they are ciliate and with scabrous midrib.

[1] Proc. Am. Acad. Arts & Sci. xvi, 80 (1881).

[2] Hort. Kew. ed. 1, iii, 214 (1789).

[3] Alm. Bot. Phyt. (Omn. op. iv) 389 (1696); Phyt. sive Stirp. Ill. minus Cogn. Ic. Tab. Aen. (Omn. op. i) t. 116, f. 6 (1691).

[4] Fl. Bor.-Am. ii, 117 (1803).

[5] Michx. l. c. 118.

[6] Sketch Bot. S.-C, & Ga. ii, 377 (1824).

[7] DC. Prod. Syst. Nat. Regn. Veg. 334 (1886).

[8] Gard. Dict. ed. 8, no. 19 (1768).

To the species already enumerated is now to be added a new one, as distinct as *S. fistulosa* or *S. tortifolia*, and if anything more so than *S. Chapmanii.* Most striking in this new species are the very long, ascending branches of the inflorescence, usually arising from nearly the same point on the stem and gracefully curved, producing in a typical inflorescence an effect altogether unlike that of any other inflorescence in the genus Solidago, in shape suggesting an ordinary feather-duster or the familiar European besom, or broom made of fagots (the *scopae* of the Romans), if one may use such homely similes.

This very distinct species was first observed by Mr. S. C. Hood in the vicinity of Orange City, Florida. Mr. Ivar T. Tidestrom kindly referred to me for study specimens of it which he collected there.

Key to the Allies of S. odora and S. Chapmanii.

a. Leaves, or at least the upper ones, entire, glabrous except for the scabrous margins, or with scabrous midrib. b.
- *b.* Leaves all entire, not clearly differentiated into upper and lower cauline; involucral scales not with rounded nor erose apex, generally acute. c.
  - *c.* Stems scabrous, with minute hairs only; leaves with glabrous midrib, more or less prolonged beyond the apex, usually anise-scented, but sometimes odorless; branches of the inflorescence relatively short, not with a long portion below the flowers. d.
    - *d.* Leaves all long lanceolate or linear-lanceolate, acuminate. *S. odora.*
    - *d.* Leaves some or all of them oblong or elliptic-ovate, more often obtuse, at least not acuminate, and strongly inclined to be thick and rigid.[1] *S. Chapmanii.*
  - *c.* Stems very rough, with short but conspicuous bristly hairs; leaves with scabrous midrib, rounded and hardened at the tip but not prolonged, and with a characteristic goldenrod odor; branches of the inflorescence elongate (averaging 2.3–3 dm. in length), ascending, with a long portion below the flowers. *S. aspericaulis.*
- *b.* Lower leaves remotely serrate, distinguished into upper and lower, often rather abruptly; involucral scales with rounded and erose apex. *S. tortifolia.*

a. Leaves all minutely crenate-serrate, generally with scabrous hairs scattered over lower surface, gradually decreasing in size from base to summit. *S. fistulosa.*

Solidago odora Ait. Hort. Kew. ed. 1, iii, 214 (1789).

Virga aurea Americana Tarraconis facie & sapore, panicula speciosissima Pluk. Alm. Bot. Phyt. (Omn. op. iv) 389 (1696); Phyt. sive Stirp. Ill. minus Cogn. Ic. Tab. Aen. (Omn. op. i) t. 116, f. 6 (1691).

S. retrorsa Michx. Fl. Bor.-Am. ii, 117 (1803); Ell. Sketch Bot. S.-C. & Ga. ii, 377 (1824).

S. lanceolata Bosc ex DC. Prod. Syst. Nat. Regn. Veg. 334 (1886).

[1] Rigidity is also characteristic of the leaves of *S. aspericaulis.*

Solidago Chapmanii Gray, Proc. Am. Acad. Arts & Sci. xvi, 80 (1881).

S. odora Chapm., in part, Fl. So. U. S. ed. 1, 213 (1860).

Solidago **aspericaulis** A. H. Moore, spec. nov.

Caulibus inflorescentiae ramisque asperrimis, numerosissimis pilis horridis instructis; foliis 2–4.3 cm. longis 0.7–1.3 cm. latis (in inflorescentiae ramis infra axem verum numerosis 1–1.3 cm. longis 3.6 mm. latis), odore maximarum huius generis specierum proprio, sessilibus vel subamplexicaulibus et auriculatis aut subcordatis ovatolanceolatis, apice duro obtuso non nervo medio prolongato, ciliatis, marginibus scaberrimis paucissimis dentibus rotundatis duris inconspicuis praeditis, nervo medio scabro; inflorescentiae ramis crassis longis subaequalibus subfasciculatis plerisque valde et venuste curvatis longitudine tota 1.3–3 (plerumque 2.3–3) dm., longitudine infra flores plerumque ca. 1.4 dm. (Tota inflorescentiae altitudo ca. 1.2–3 dm., maxima latitudo 2.5–3 dm.); involucris 5–5.5 mm. altis ca. 2.5–3 mm. latis numerosis secundis; involucri squamis linearibus plerumque acutis glabris dorso rotundato non carinato; achaeniis minute pubescentibus.

Type specimen: Florida, Volusia County, Orange City, Oct. 12, 1913 (*Ivar T. Tidestrom*, no. 7051, in Herb. Tidestrom. Co-types in Herbb. Riks Mus., Gray, U. S. Nat. Mus., and Moore).

The branches of the inflorescence in *S. aspericaulis* are stouter and longer than in either *S. Chapmanii* or *S. odora*, as well as being more characteristically aggregated in subfasciculate manner. From these two species it differs also in the greater roughness of the stems (the larger grayish, instead of more frequently brownish or yellowish hairs in correspondence to their size, appearing more noticeably transverse banded under a lens of moderate power), and in the typical and strong goldenrod odor, instead of the anise scent usual in the two species named.[1] The involucral scales in *S. odora* are distinctly keeled, in *S. Chapmanii* less noticeably, and in *S. aspericaulis* and the other species not at all. From *S. odora*, in addition to the above characters, *S. aspericaulis* differs in the oblong, obtuse or at least not acuminate, instead of longer, lanceolate leaves, and the wholly glabrous, instead of ciliate involucral scales. From *S. Chapmanii*, whose leaves are similar in shape but slightly less oblong or elliptic, the new species further differs in not having the blunt prolonged midrib, and in its glabrous, instead of minutely pubescent and ciliate involucral scales. From *S. tortifolia* it is distinguished by its leaves all being essentially

[1] In some specimens the anise scent is wanting, but the odor does not seem to change its quality.

entire, its bristly, instead of merely scabrous puberulent stems, and the generally acute involucral scales, not rounded at tip, nor erose. From *S. fistulosa* it differs in the entire, instead of crenate-serrate leaves, not distinctly divided into upper and lower cauline, whereas *S. fistulosa* shows a pronounced gradation in the leaves from base to summit. *S. aspericaulis* finds its nearest relative probably in *S. Chapmanii*, although it is abundantly distinct from it.

Solidago tortifolia Ell. Sketch Bot. S.-C & Ga. ii, 377 (1824).

S. odora Michx.? Fl. Bor.-Am. ii, 118 (1803), not Ait.

Solidago fistulosa Mill. Gard. Dict. ed. 8, no. 19 (1768).

S. pilosa Walt. Fl. Car. 207 (1788). This is usually referred here, but the description is very meagre.

Washington, D. C.

IS ARENARIA LATERIFLORA DIOECIOUS?

Wilhelm Suksdorf.

Mr. R. W. Woodward's paper, On Variation in *Arenaria lateriflora*, in Rhodora for December, 1913, was very interesting to me, since I had made almost exactly the same observations on the related species *Arenaria* (or *Moehringia*) *macrophylla* about ten years ago. However, my conclusions were somewhat different, for I began to look upon the two forms as the two sexes of a dioecious species. The form with long stamens and short pistil does not produce seeds, at least not in many cases, and its petals are more conspicuous than in the other form, which has a longer pistil and short, apparently imperfect stamens. Many specimens of both forms were collected in 1904 and later distributed under one number (4033) but with separate labels, and the sex was indicated on the label in each case. My collection of this plant consists of 17, or if the sexes are kept separate, of 20 sheets, collected at nearly as many different places north and west of Bingen, Washington, scattered over an area about 30 miles wide each way, the altitude varying from 125 to 3000 feet or more. Of the 20 specimens 7 are pistillate and 13 are staminate, only one of the latter has a conspicuous ovary which, however, may be sterile.

My collection of *M. lateriflora* comprises only 5 numbers as follows: 1 from Cambridge, Massachusetts and 1 from Iowa, both with long stamens, and 3 from Spokane Co., Washington, one of these is pistillate, the other two consist of both sexes on different stems. In one long-stamened flower there is a capsule not very small, but it seems to be seedless.— To me it seems fairly certain that these two species are dioecious or nearly so. There may be a third form having long stamens and also producing seeds, but that is still doubtful. Further observations at many different places may perhaps be needed to settle this point.

Bingen, Washington.

A cut-leaved Alder.— On the edge of a wet thicket at Norris Arm, at the mouth of the Exploits River in Newfoundland, there occurs a large clump of the common swamp Alder, *Alnus incana* (L.) Moench, with the leaves deeply pinnatifid. When the plant was first examined it was taken to be the shrub known in cultivation as *A. incana*, var. *pinnatifida* Wahlenb., but closer study shows that it cannot be placed with var. *pinnatifida*, for that shrub, known in the wild state only in Sweden, has the leaves densely pubescent beneath (see Callier in Schneider, Handb. der Laubholzk. i. 136). The Newfoundland shrub is clearly an extreme of the common American *A. incana*, var. *glauca* Ait., differing, like var. *glauca*, from typical *A. incana* of Europe, in having the leaves very glaucous beneath and quickly glabrate except on the veins. It should be called

Alnus incana (L.) Moench, var. glauca Ait., forma **tomophylla**, n. f., foliis elongatis irregulariter laciniato-pinnatifidis.— Leaves elongate, irregularly laciniate-pinnatifid.— Newfoundland: border of a wet thicket, Norris Arm, August 21, 1911, *Fernald & Wiegand*, no. 5303 (type in herb. Gray). A somewhat similar but less characteristic specimen from Maine: Hartford, August, 1892, *J. C. Parlin*.— M. L. Fernald, Gray Herbarium.

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SOME ANNUAL HALOPHYTIC ASTERS OF THE MARITIME PROVINCES.

M. L. Fernald.

(Plate 109.)

When the genus *Aster* was worked over for the seventh edition of Gray's Manual the three annual species included were noted as occurring on the marshes or saline sands of the lower River or the Gulf of St. Lawrence, two of the records based upon collections by the present writer, and one upon a specimen from Professor John Macoun. The three species, as then treated, were *A. subulatus* Michx., the continuous northeastward range of which stops at the New Hampshire coast, but which is represented by a plant discovered in 1902 by Mr. Emile F. Williams and the writer on the saline shores of Nepisiguit Bay, an arm of the Baie des Chaleurs in northeastern New Brunswick; *A. angustus* (Lindl.) T. & G., a plant of the Great Plains of western North America and of salt plains of Siberia and Afghanistan, which has an isolated station on the shores of the St. Lawrence at Cacouna, Temiscouata Co., Quebec; and *A. frondosus* (Nutt.) T. & G. of alkaline spots among the Rocky Mountains, with which was identified a specimen collected in 1888 by Professor John Macoun at Brackley Point, Prince Edward Island, and sent to the Gray Herbarium as *A. subulatus*.

During the summer of 1912, while botanizing about the Gulf of St. Lawrence, Messrs. Bayard Long, Harold St. John and the writer made a special point of collecting adequate material of the Prince Edward Island plant. It was found to be somewhat general in brackish sands

of the "North Shore," i. e. the outer or Gulf shore of the island, at least from Tignish to Grand Tracadie, while a seemingly identical plant was found on brackish shores at Étang du Nord, at the southern end of Grindstone Island in the Magdalen Island group; and a closely related but obviously distinct plant was found in great profusion covering the damp brackish sands at Grande Entrée near the northern end of the Magdalen Islands.

Upon critically studying this material it was quickly apparent that the Prince Edward Island plant, which had been originally distributed as *Aster subulatus* and subsequently referred to *A. frondosus*, could have no specific connection with either, for it has quite rayless heads like those of the unique *A. angustus*, and in its very foliaceous involucre it is unlike any described species. It was also apparent that the little plant so abundant at the northern end of the Magdalen Islands differed in some pronounced varietal characteristics from the plant of Grindstone Island and of Prince Edward Island.

In the course of this study of the annual Asters from Prince Edward Island and the Magdalen Islands, the plant from northeastern New Brunswick, which had been referred to *A. subulatus*, was also reexamined and found to differ in certain important points from the plant of our Atlantic coast. It was consequently gratifying that, in his explorations of the coastal sands of eastern New Brunswick during the late summer and autumn of 1913, Mr. Sidney F. Blake was able to secure a collection of mature material of the so-called *A. subulatus* from the shores of Nepisiguit Bay and thus to reinforce the characters already noted in the rather immature material of Williams & Fernald. And it was especially interesting that, upon the marshes of the Tracadie Lagoon of northeastern New Brunswick, Mr. Blake should also find a third area of the little rayless species already known from the islands in the Gulf; but the most notable point about the plant of the Tracadie Lagoon is that, while clearly belonging specifically with the others, it should show in its foliage and involucres characters almost exactly intermediate between the plant of the Prince Edward Island sands and the extreme variety which covers the sands of Grande Entrée, near the northern end of the Magdalen Islands.

The third species of this remarkable group of annual Asters of the St. Lawrence shores, the plant identified with *Aster angustus*, has not, so far as the writer is aware, been collected since he and Professor J. F. Collins found over-ripe material at the border of a salt marsh at Ca-

couna in 1904. But of the peculiar plants from the Gulf of St. Lawrence we now have an abundance of material; and it is clear that the rayless one is distinct from the species with which the earlier and inadequate collection was placed and that the other, from Nepisiguit Bay, is a pronounced variety of the southern *A. subulatus*.

The rayless plant may be called

Aster (Conyzopsis) **laurentianus**, n. sp., planta annua ubique carnosa 3–25 cm. alta, caule subsimplici vel cum ramis brevibus axillaribus racemosis 1-capitatis instructo vel interdum ramis elongatis; foliis lineari-spathulatis vel -lanceolatis obtusis vel acutiusculis mucronatis integris 2–6 cm. longis 2–7 mm. latis; involucro hemispherico-campanulato, bracteis 2–3-seriatis plerumque foliaceis carnosis lanceolatis lineari-spathulatis vel lineari-oblongis acuminatis mucronatis plerumque subaequalibus 5–8 mm. longis, exterioribus 3–5 valde elongatis 8–18 mm. longis 1–2 mm. latis; corollis exterioribus numerosis filiformibus eligulatis stylo brevioribus, corollis centralibus paucis filiformibus limbo campanulato 4–5-fido flavescentibus stigmata purpurascentia subaequantibus; achaeniis pilosis.

Annual, glabrous throughout, fleshy, 3–25 cm. high; the stem subsimple or with short axillary racemose 1-headed branches or occasionally with elongate branches: leaves linear-spatulate or -lanceolate, obtuse or acutish, mucronate, entire, 2–6 cm. long, 2–7 mm. wide: involucre hemispherical-campanulate: the bracts in 2–3 series, mostly foliaceous and fleshy, lanceolate, linear-spatulate or linear-oblong, acuminate, mucronate, mostly subequal, 5–8 mm. long; the exterior 3–5 very elongate, 8–18 mm. long, 1–2 mm. wide: the outer corollas numerous, filiform, without rays, shorter than the style; central corollas few, filiform, with a 4–5-toothed campanulate limb, yellowish, about equaling the purplish stigmas: achenes pilose.— Prince Edward Island: damp sand back of the strand, Tignish, August 6, 1912 (barely in anthesis), *Fernald, Long & St. John*, no. 8163; salt marshes, Brackley Point, September 5, 1888, *J. Macoun* (distributed as *A. subulatus*); damp brackish sands, Brackley Point, August 31, 1912, *Fernald, Long & St. John*, no. 8166 (type in Gray Herb.); wet brackish sand, Grand Tracadie, August 31, 1912, *Fernald, Long & St. John*, no. 8167. Magdalen Islands: wet brackish sand or mud at the margin of a pond southwest of Étang du Nord village, Grindstone Island, August 15, 1912, *Fernald, Long & St. John*, no. 8164. Figs. 1–3.

Var. **magdalenensis**, n. var., humilis 3–5 cm. altus valde carnosus; foliis spathulatis apice rotundatis vel obtusis; bracteis exterioribus 5–11 haud elongatis spathulatis vel oblongis vel anguste ellipticis plerumque obtusis 8–10 mm. longis 2–4 mm. latis.

Low, 3–5 cm. high, very fleshy: leaves spatulate, rounded or obtuse at apex: outer bracts 5–11, not at all elongated, spatulate, oblong or

narrowly elliptic, mostly obtuse, 8–10 mm. long, 2–4 mm. wide.— Magdalen Islands: damp brackish sandy beach, Grande Entrée, Coffin Island, August 19, 1912, *Fernald, Long & St. John*, no. 8165 (type in Gray Herb.). Fig. 4.

Var. **contiguus**, n. var., humilis 2–13 cm. altus; foliis spathulatis apice rotundatis vel obtusis: bracteis exterioribus 5–11 lineari-oblongis haud vel rare elongatis acutis vel acutiusculis 5–10 mm. longis 1–2 mm. latis.

Low, 2–13 cm. high: leaves spatulate, rounded or obtuse at apex: outer bracts 8–11, linear-oblong, not at all or rarely elongated, acute or acutish, 5–10 mm. long, 1–2 mm. wide.— New Brunswick: drier spots in marsh, Tracadie, Gloucester Co., September 10, 1913, *S. F. Blake*, no. 5645 (type in Gray Herb.). Fig. 5.

In its rayless marginal flowers (fig. 2) *Aster laurentianus* is nearest related to *A. angustus*, which has the linear-attenuate leaves and the very slender involucral bracts ciliate. Though formerly confused with *A. frondosus*, *A. laurentianus* has less affinity with that species than with *A. angustus*. In *A. frondosus* the ligule is well developed and the involucre has its outer series of bracts successively shorter than the inner, while in the rayless *A. laurentianus* the outer series are successively longer.

Aster laurentianus belongs to a peculiar little group of annual species (§ *Conyzopsis*) widely dispersed in saline or subsaline habitats and somewhat transitional in their floral structure between true *Aster* and the genus *Conyza*.[1] By some authors the section *Conyzopsis* is kept apart generically (as it once was by Asa Gray) from *Aster* as *Brachyactis*, characterized as a group of annuals with "rays not exceeding the mature pappus or none";[2] but, as long ago pointed out by Asa Gray, the annual *A. subulatus* (generally maintained as an *Aster*, not a *Brachyactis*) "with its inconspicuous rays, hardly surpassing the disk and commonly surpassed by the mature pappus, and with its fewer disk-flowers, must be held to invalidate the genus *Brachyactis*."[3] The distinctness of *Brachyactis* as a genus is further menaced by the publication of such species as *B. hybrida* Greene, a plant said by its author to be "remarkable as a *Brachyactis* for its many long rays [about 1 cm. long], as well as by its apparently perennial duration; otherwise it is at perfect agreement with other members of this well marked genus."[4]

[1] See Gray, Proc. Am. Acad. xvi. 99 (1880).

[2] Britton in Britton & Brown, Ill. Fl. ed. 2, iii. 348 (1913).

[3] Gray, l. c.

[4] Greene, Leaflets, i. 147 (1905).

Aster subulatus as it occurs on Nepisiguit Bay, isolated by many hundreds of miles of coast-line from the northern limit of continuous occurrence of the species, differs at a glance in its spatulate obtuse leaves; and in some other characters it departs from typical *A. subulatus* of the Atlantic Coast. Its strongly ascending branches bear few comparatively scattered heads; the involucres are more herbaceous, the bracts in some plants subequal; and the ligules more prominent than is common in *A. subulatus* and strongly inclined to be in only 1 row. These characters, if constant, would indicate a clearly marked species, but a close study of the available material shows that they are not absolute. The lower and median cauline leaves are usually fairly constant in their rounded apex but a few individuals from New Brunswick show acute or acuminate tips; the erect branching is exhibited by occasional small plants of otherwise good *A. subulatus;* the herbaceous involucre, though reasonably constant in the New Brunswick collections, is strongly approached by plants from the Boston district, and exceptional individuals of the New Brunswick series have the outer bracts as short as in typical *A. subulatus;* and the ligules, though longer in the New Brunswick plant than in most of the material from the Atlantic coast, are very closely approached in occasional plants from southern New England, where their length and number are variable. It seems to the writer, then, that the plant from Nepisiguit Bay is best treated as

Aster subulatus Michx., var. **obtusifolius**, n. var., foliis inferioribus mediisque spathulatis apice rotundatis vel obtusis; ramis arcte adscendentibus paucicapitatis; bracteis involucri plerumque subaequalibus exterioribus subherbaceis; ligulis 4–5 mm. longis pappum valde superantibus.

Lower and median leaves spatulate, rounded or obtuse at apex: branches strongly ascending, bearing few heads: involucral bracts mostly subequal, the outer subherbaceous: ligules 4–5 mm. long, obviously exceeding the pappus.— New Brunswick: abundant on sandy salt marsh at mouth of Nepisiguit (possibly Middle) River, Bathurst, July 25, 1902, *E. F. Williams & M. L. Fernald;* brackish marsh along Middle River, Bathurst, August 13, 1913, *S. F. Blake*, no. 5372 (type in Gray Herb.).

Explanation of Plate 109.

Fig. 1. *Aster laurentianus*, ×1; fig. 2, marginal flower, ×5; fig. 3, corolla of central flower, ×5. Fig. 4. *A. laurentianus*, var. *magdalenensis*, ×1. Fig. 5. *A. laurentianus*, var. *contiguus*, ×1. Fig. 6. *A. subulatus*, var. *obtusifolius*, × 1.

Gray Herbarium.

NOTES ON NEW ENGLAND HEPATICAE,— XI.

Alexander W. Evans.

In the last paper[1] of this series the rare *Neesiella pilosa*, a member of the Marchantiaceae, was reported for the first time from New England. The scanty material which served as the basis for this record was collected in 1898 by F. G. Floyd, at the base of a limestone-bearing cliff on Willoughby Mountain in northern Vermont. During the past summer it was the writer's good fortune to visit this interesting botanical region under the guidance of Miss Annie Lorenz, to whom it had long been familiar. As a result of this visit several species were added to the hepatic flora of Vermont, four of which represent additions to the New England flora as well. Of these four species two, *Clevea hyalina* and *Neesiella rupestris*, belong to the Marchantiaceae. These are especially worthy of note because the total number of Marchantiaceae known from New England is only ten, and because there is little probability that this number will be materially increased. The other additions include *Lophozia grandiretis* and the curious *Diplophyllum gymnostomophilum*, a species which has been shifted about from one genus to another since it was originally described in 1896. The paper discusses also the synonymy of *Lophozia quinquedentata* and *Cephalozia media*, proposes a new name in the genus *Plagiochila*, and is concluded by a list of additions to local state floras and a census of New England Hepaticae according to the information now at hand.

1. Clevea hyalina (Sommerf.) Lindb. Not. Soc. F. et Fl. Fenn. **9**: 291. 1868. *Marchantia hyalina* Sommerf. Mag. Naturw. II. **1**: 284. 1833. *Sauteria hyalina* Lindb. Öfver. Vetensk.-Akad. Förh. **23**: 561. 1866 (in part). *Plagiochasma erythrospermum* Sulliv.; Austin, Proc. Acad. Philadelphia for 1869: 229. *Aitonia erythrosperma* Underw. Bull. Illinois State Lab. Nat. Hist. **2**: 43. 1884. On a limestone-bearing cliff, Willoughby Mountain, Vermont (*Miss Lorenz & A. W. E.*, July, 1913). New to New England. The material grew on sandy detritus, partially overhung by the steep rocks. Most of the stations were shaded and more or less protected from the rain. The carpocephala found were old and weathered, and a trip in May or

[1] Rhodora **14**: 209–225. 1912.

June would probably be necessary to secure them in good condition. *Clevea hyalina* is a species of arctic and alpine regions and is known from many localities in Europe. In North America it has already been collected in Greenland, Ellesmere Land, North Lincoln, Quebec, British Columbia, Montana, Colorado, Idaho, Utah, Washington, and California. The species is fully described by Howe in his Hepaticae and Anthocerotes of California [1] and by K. Müller in his Lebermoose Deutschlands, Oesterreichs und der Schweiz.[2] Numerous interesting details may be found also in Solms-Laubach's account of the "Marchantiaceae Cleveideae und ihre Verbreitung." [3] The plant, however, is so different from the other Marchantiaceae known from New England that a few words about its most striking peculiarities may not be out of place.

The genus *Clevea* belongs to the group Astroporae of Leitgeb,[4] so called because the small epidermal pores are surrounded by cells the radial walls of which are strongly thickened. This peculiarity is well marked in typical forms of *C. hyalina* but not in Howe's variety *californica*, known only from California, or in the rare *C. Rousseliana* (Mont.) Leitgeb, known only from Greece, Italy, Algeria, and the Canary Islands. Other interesting features of the Astroporae are found in the method of dehiscence of the capsule and in the cells of the capsule-wall. The wall splits from the apex to about the middle into several irregular lobes with ragged edges, and no definite lines of dehiscence can be distinguished. The capsule-wall is composed of a single layer of cells, the walls of which show numerous thickenings in the form of rings or half-rings. In these respects the Astroporae agree with most of the complex Compositae (including the genera *Conocephalum, Lunularia, Marchantia,* and *Preissia*) and differ sharply from the Operculatae (including the genera *Asterella, Grimaldia, Neesiella,* and *Reboulia*), in which the capsule opens by a more or less distinct circular lid and is composed of cells without annular thickenings. In addition to *Clevea* the Astroporae include the two genera *Sauteria* and *Peltolepis,* both of which have been reported from northern North America. In the structure of the thallus these three genera are very much alike, but good generic characters are afforded by the

[1] Mem. Torrey Club **7**: 36. 1899.
[2] Rabenhorst's Kryptogamen-Flora **6**: 241. 1907.
[3] Bot. Zeitung **57** [1]: 15–37. 1899.
[4] Unters. über Lebermoose **6**: 49. 1881.

inflorescences, both male and female. In *Clevea* and *Sauteria* the antheridia are borne in irregular and poorly defined groups on the upper surface of the thallus and are not surrounded by protective scales. In *Peltolepis* the antheridia are collected in definite disc-like inflorescences surrounded by scales. In *Clevea* the stalk of the carpocephalum arises from the upper surface of the thallus and is quite destitute of longitudinal grooves enclosing rhizoids. In *Sauteria* and *Peltolepis* the stalk arises from the end of a thallus-branch; in *Sauteria* there is one rhizoid-bearing groove present and in *Peltolepis* two. These differential characters indicate that *Clevea* occupies the lowest place in the Astroporae from the standpoint of phylogeny and *Peltolepis* the highest.

The thallus in *Clevea hyalina* is smaller than in most of the New England Marchantiaceae, averaging about 3 mm. in width. The upper surface is typically green, sometimes with a glaucous cast, but the margins in some cases at least are bordered with purple. The boundaries of the air-spaces show clearly under the lens. The ventral scales are large and conspicuous and extend beyond the margin of the thallus. At the apical extremity they form a distinct cluster extending backward over the growing point. The scales are pointed and are either white and hyaline throughout or else more or less tinged with purple. These scales form one of the most characteristic features of the species and are often of great service in the determination of sterile material.

2. Neesiella rupestris (Nees) Schiffn.; Engler & Prantl, Nat. Pflanzenfam. 1^3: 32. *f. 17, G–K* (after Bischoff). 1893. On a limestone-bearing cliff, Willoughby Mountain, Vermont (*Miss Lorenz & A. W. E.*, July, 1913). New to New England but already known, in North America, from Quebec, Ontario, New York, Ohio, and Illinois. Also known from various parts of Europe and from Japan. Since the most important characteristics of the species were described by the writer in the Bryologist for September, 1911, it will not be necessary to repeat them here. The Vermont material is not abundant. It grew in localities similar to those described under *Clevea hyalina*, and the two species were occasionally mixed. Unfortunately the few carpocephala collected were so old and weathered that the united spirals of the elaters, first noted by Schiffner, could not be clearly demonstrated. The specimens lacked, however, the abundant scales

found in *N. pilosa,* so that their reference to *N. rupestris* is probably correct. It is to be regretted that no satisfactory specimens of *N. pilosa* were collected, although the cliff where F. G. Floyd found his material was visited. This was very likely due to the fact that the plants were collected after they had passed their prime, so that it was difficult to distinguish between similar species in the field. It should be borne in mind, however, that *N. pilosa* and *N. rupestris* are very closely related species and that there is some possibility that they may not be distinct. Schiffner has already mentioned this possibility and describes a region in the Tirol where *Neesiella carnica* (Massal.) Schiffn., a species doubtfully distinct from *N. pilosa,* grows in company with plants which cannot be distinguished from *N. rupestris* and also with plants which seem to be intermediate between *N. carnica* and *N. rupestris.*[1] He suggests two explanations: first, that the specimens of apparent *N. rupestris* may actually represent true *N. rupestris,* in which case *N. carnica* and *N. rupestris* would be synonymous; second, that they may simply represent individuals of *N. carnica,* so affected by deep shade and increased water-supply that they resemble *N. rupestris* in all respects. He hesitates to decide the question on the basis of what he found in a single locality but recommends it for the consideration of others who may be fortunate enough to make observations upon these rare plants in the field. If it should ever be established that *N. pilosa, N. rupestris,* and *N. carnica* were synonyms, the species would have to bear the name *N. pilosa* on the ground of priority.

3. Lophozia grandiretis (Lindb.) Schiffn. Lotos **51**: [20]. 1903. *Jungermannia grandiretis* Lindb. Medd. Soc. F. et Fl. Fenn. **9**: 158. 1883 (*nomen nudum*); Kaalaas, Nyt Mag. for Naturv. **33**: 322. 1893. On moist exposed earth in a marly swamp, Willoughby, Vermont (*Miss Lorenz & A. W. E.*, July, 1913). Collected also by A. H. Brinkman at Banff, Alberta, in 1912 (No. 606, in part). New to North America. In Europe the species is known from a few scattered localities in Norway, Sweden, Finland, Denmark, Germany, and Switzerland. The material from Vermont is destitute of sexual organs but bears gemmae in abundance. It agrees closely with the specimens distributed by Schiffner (as a new variety *humilis*) in his Hepaticae Europaeae, No. 116. At first glance the species bears some

[1] Hedwigia **47**: 315. 1908.

resemblance to *L. Mildeana* (Gottsche) Schiffn., but the gemmiparous branches and the gemmae themselves would indicate that it was really much more closely related to *L. incisa* (Schrad.) Dumort. Stephani, in fact, goes so far as to include it among the synonyms of *L. incisa.* Interesting observations on *L. grandiretis* have been published by Schiffner,[1] while a full account of the species, with figures, is given by K. Müller.[2]

The stems of *L. grandiretis* are simple or sparingly branched and are more or less pigmented with purple or blackish brown on the lower surface. The leaves are delicate in texture and pale green and are remarkable for being broader than long. In normal cases they are unequally bifid for about one third their length with broadly triangular, bluntly pointed lobes, the margins of which are commonly entire. Toward the apex of the stem trifid leaves are often developed. The leaf-cells are unusually large and are accountable for the specific name of the plant. At the apices of the lobes, according to K. Müller, the cells measure 40–50 μ in diameter, but in the middle of the leaf they attain a length of 60–80 μ and a width of 40–50 μ. The walls are rather thick and small trigones are usually developed. The cuticle is smooth. Underleaves are absent except in the female inflorescence.

The gemmiparous branches bear the gemmae on the tips of crowded leaves, somewhat reduced in size, and the development of the gemmae quickly brings the growth of the branches to an end. The gemmae, which have recently been figured by Warnstorf,[3] measure 25–30 μ in diameter. They are unicellular or bicellular and are sharply angular or even stellate.

Even in the absence of inflorescences *L. grandiretis* may usually be distinguished without much trouble from *L. incisa.* In the latter species the stems are green throughout, the leaves are longer than broad, the lobes of the leaves often bear angular or spine-like teeth, the cells measure only 25 μ in diameter at the apices of the lobes and only 30–40 μ in the middle of the leaf, the cell-walls are thin, and trigones are scarcely to be demonstrated. The gemmiparous branches and the gemmae are much alike in the two species, although the gemmae in *L. incisa* are distinctly smaller, averaging only 15 μ in diameter.

In the opinion of Warnstorf *L. grandiretis* is closely related to *L.*

[1] Oesterr. Bot. Zeitschr. **57**: [5]. 1907.
[2] Rabenhorst's Kryptogamen-Flora **6**: 705. *f. 322.* 1910.
[3] Hedwigia **53**: 209. *f. 4.* 1913.

marchica (Nees) Steph., more closely in fact than to *L. incisa.* In *L. marchica* the stems are deeply pigmented, the leaves are usually broader than long, and the leaf-cells measure 40–50 μ in diameter in the middle of the leaf. But the leaves are much more frequently trifid or even quadrifid, the cell-walls are thin, and there are no trigones. The gemmae, too, are very different. They are unicellular bodies about 16 μ in diameter and are spherical or oval in form with an even surface. In *L. Mildeana,* a close ally of *L. marchica,* a species to which reference has already been made, the stems are usually unpigmented, although the leaves vary in color from pale green to deep purple. Here again the leaves are frequently trifid or quadrifid and the leaf-cells average about 40 μ in diameter in the middle of the leaf, but the walls are sometimes more or less thickened and trigones may sometimes be discerned. The gemmae in *L. Mildeana* are similar to those of *L. marchica,* but the gemmiparous shoots are slender and upright, with minute scattered leaves, and bear a mass of crowded and reduced gemmiparous leaves at the apex.

4. Lophozia quinquedentata (Huds.) Cogn. Bull. Soc. Roy. Bot. de Belgique **10**: 279. 1872. *Jungermannia quinquedentata* Huds. Fl. Angl. Ed. I. 511. 1762. *J. Lyoni* Tayl. Trans. Bot. Soc. Edinburgh **1**: 116. *pl. 7.* 1844. *Lophozia Lyoni* Steph. Bull. de l'Herb. Boissier II. **2**: 157. 1902. *Barbilophozia quinquedentata* Loeske, Verh. Bot. Ver. Prov. Brandenburg **49**: 37. 1907. In the writer's first series of "Notes on New England Hepaticae" [1] the name *Lophozia Lyoni* was used for the present species instead of *L. quinquedentata,* in spite of the fact that *Jungermannia quinquedentata* Huds. was published so much earlier than *J. Lyoni* Tayl. The older name was discarded because there seemed to be some doubt as to which species Hudson's *J. quinquedentata* actually represented. Pearson,[2] for example, without going so far as to include *J. quinquedentata* among the synonyms of *J. barbata* Schmid., quotes a letter from Spruce, saying that the two species are probably identical. Schiffner [3] admits that Hudson's description of *J. quinquedentata* is much too brief to lead to a positive determination. He states, however, that Hudson gave, as a reference to his species, Dillenius, Historia

[1] Rhodora **4**: 210. 1902.
[2] Hep. British Isles 341. 1901.
[3] Lotos **53**: [16]. 1905.

Muscorum, *pl. 71, f. 23,* and that this figure undoubtedly represents *J. quinquedentata* as understood by later authors. He maintains further that this opinion is supported by the specimens in the Dillenian herbarium and quotes Lindberg as his authority for this statement. Unfortunately Lindberg is not quite so definite as Schiffner implies. In the latest of the three works quoted, Kritisk Granskning af Mossorna uti Dillenii Historia Muscorum (Helsingfors, 1883), he says (p. 41) that the figure of Dillenius and the corresponding specimen in his herbarium represent a mixture of *Bazzania trilobata* (L.) B. Gr. and *J. quinquedentata* Huds. According to his account the portion of the figure showing the vegetative leaves is drawn from the *B. trilobata,* while the terminal perianth is drawn from the *J. quinquedentata.* It is to be regretted that the evidence in favor of Hudson's species is not absolutely conclusive. At the same time the fact that the perianths in the Dillenian figures and specimens belong to *J. quinquedentata* as now understood is perhaps sufficient justification for the use of Hudson's specific name. In the writer's "Revised List of New England Hepaticae"[1] the name *Lophozia quinquedentata* is therefore taken up instead of *L. Lyoni,* and this usage prevails in the recent works of K. Müller, Macvicar, and other European hepaticologists.

5. **Plagiochila Austini** nom. nov. *P. spinulosa* Aust. Hep. Bor.-Amer. No. 9. 1874 [not *P. spinulosa* (Dicks.) Dumort.]. *P. Sullivantii* Evans, Bot. Gazette **21**: 191. 1896 (in part). *P. Sullivantii* Steph. Bull. Herb. Boissier II. **3**: 335. 1903. The name *Plagiochila Sullivantii* was originally given by Gottsche to the specimens distributed by Sullivant in his Musc. Alleg. No. 219. These specimens were collected "in sylvaticis montosis Virginiae" and were referred by Sullivant to the European *P. spinulosa* (Dicks.) Dumort. Gottsche included under his *P. Sullivantii* a second specimen from North Carolina, preserved in the Lindenberg herbarium at Vienna. Unfortunately he neglected to publish a description of his new plant; it remained as a manuscript species in his herbarium. When the writer published his "Notes on the North American Species of *Plagiochila,*" in 1896, *P. Sullivantii* was among the species proposed as new. It was understood, however, in a somewhat broader sense than the species of Gottsche and was made to include not only the two plants which he

[1] Rhodora **15**: 25. 1913.

studied but also the material distributed by Austin in his Hep. Bor.-Amer. No. 9, and a series of specimens from New England, New York, and Pennsylvania. At the same time the point was strongly emphasized that Sullivant's specimens were to be considered the type of the species. When Stephani, several years later, monographed the genus *Plagiochila* for his "Species Hepaticarum" he expressed the opinion that *P. Sullivantii*, as described and figured in the "Notes," was an aggregate and included two distinct species, an opinion with which the writer is now disposed to concur. Instead, however, of reserving the name *P. Sullivantii* for the type of the species, he applied it to the plants from New England, Pennsylvania, and North Carolina. For Sullivant's specimens he chose the manuscript name *P. alleghenicnsis* Evans, a name given to these plants by the writer at the beginning of his studies on *Plagiochila* but discarded in favor of Gottsche's name when the results of these studies were published. Stephani's course does not seem warranted because it excludes from Gottsche's species the very specimen that was definitely cited as the type at the time the species was published. It therefore seems necessary to restrict the name *P. Sullivantii* so that it may include this type specimen and to give the species segregated from *P. Sullivantii* a new name as indicated above. Austin's specimens distributed in Hep. Bor.-Amer. No. 9, may then be regarded as the type of *P. Austini*. They were collected on "shaded steep rocks in mountainous regions," and probably came either from the White Mountains or from New York. The following more definite stations for the species may likewise be quoted: White Mountains, New Hampshire (*T. P. James*); Naugatuck, Branford, and Redding, Connecticut (*A. W. E.*) [1]; Slide Mountain, Ulster County, New York (*E. G. Britton*); Adirondack Reserve, New York (*E. G. Britton*); Canadensis, Pennsylvania (*E. G. Britton*); Quarry Run, West Virginia (*A. LeRoy Andrews*). The specimens from North Carolina must remain doubtful for the present. Of the figures published by the writer in connection with *P. Sullivantii*, the following represent *P. Austini: pl. 15, f. 18, 20, 21; pl. 16, f. 1–3.*

The narrowly ovate leaves in *P. Austini* will distinguish it from the true *P. Sullivantii*, where the leaves are distinctly obovate. The leaves are sharply spinose-dentate, the number of teeth being usually from two to six. In many cases two teeth at the apex of a leaf are

[1] Specimens from Naugatuck, incorrectly labeled "Beacon Falls" were distributed in Underwood & Cook's Hep. Amer. No. 111, under the name *P. spinulosa*.

larger than the others and give the leaf a bifid appearance. This is especially striking on shoots with poorly developed leaves, and many of the specimens produce a great many branches of this character, perhaps on account of the deep shade in which they grow. The perichaetial bracts and perianths of the species, as well as the androecia, are still unknown. There seems to be likewise no development of the slender flagilliform branches which grow out of the leaf-cells in many species of *Plagiochila* and act as organs of vegetative reproduction. The stems and branches, however, are extremely fragile, and the leaves readily become detached, especially when dry. Through their regeneration they probably play an important part in the dissemination of the species.

6. Cephalozia media Lindb. Medd. Soc. F. et Fl. Fenn. **6**: 242. 1881. *Jungermannia lunulaefolia* Dumort. Syll. Jung. Eur. 61. 1831? *Cephalozia lunulaefolia* Dumort. Recueil d'Obs. sur les Jung. 18. 1835? *Jungermannia connivens*, forma *symbolica* Gottsche; G. &. R. Hep. Europ. No. 624. 1877 (note under *J. lacinulata* Jack). *Cephalozia catenulata*, var. *pallida* Spruce, On Cephalozia 33. 1882. *C. multiflora* Spruce, *l. c.* 37. 1882. *C. symbolica* Breidl. Mitt. Naturw. Ver. Steiermark **30**: 330. 1894. *C. pallida* Spruce; Pearson, Hep. British Isles 146. *pl. 55.* 1900. *C. symbolica*, var. *pallida* Massal. Malpighia **21**: [18]. 1907. The synonymy of this common and widely distributed species has long been in confusion, and even at the present time writers disagree about the name which it ought to bear. The confusion is largely owing to the fact that the older writers failed to distinguish between *C. media* and *C. connivens* (Dicks.) Lindb. Gottsche was apparently the first to recognize the distinctive characters of the two plants, although he continued to regard them as forms of a single variable species. In 1881 Lindberg described his *C. media* and brought out its most striking differential features, but for some reason his species remained unrecognized for a long time outside of Scandinavia.

In 1882 Spruce published his *C. multiflora* as a new species, apparently in ignorance of the *C. media* of Lindberg, which he does not quote at all. Fortunately Spruce's name is antedated by Lindberg's, otherwise it might have caused a good deal of trouble on account of its being a homonym of *C. multiflora* Lindb.[1], published several years

[1] Acta Soc. Sci. Fenn. **10**: 501. 1875. See Howe (Bull. Torrey Club **29**: 281. 1902.) for a discussion of *C. multiflora* Lindb. and of Lindberg's views on *Jungermannia multiflora* Huds., upon which it was presumably based.

earlier. The next name to be taken up was the *C. symbolica* of Breidler, published in 1894. This name is still used by a number of continental writers but is invalid according to the International Rules of Botanical Nomenclature, adopted in Vienna in 1905, in spite of the fact that the name *symbolica* was published four years earlier than the name *media*. The rule which applies to the present case is embodied in Article 49 and reads, "when . . a subdivision of a species becomes a species . . the earliest name received . . in its new position must be regarded as valid." Since *Cephalozia media* was the name first applied to *Jungermannia connivens*, forma *symbolica*, when it was raised to specific rank, it is clear that the name *C. media* ought not to be supplanted by *C. symbolica*.

The name *C. lunulaefolia* of Dumortier was revived for the present species by Pearson on the authority of a letter received from Spruce, and has been adopted to a considerable extent by American writers. In Spruce's letter he comments upon the difficulty of securing authentic specimens of Dumortier's species. He states, however, that he was able to obtain, from the herbarium of the botanical garden at Brussels, specimens quoted by Dumortier in his original publication of *Jungermannia lunulaefolia* and, long afterwards, in connection with his description of *Cephalozia lunulaefolia*.[1] These specimens were distributed by Mougeot, Nestler and Schimper, under the name *J. connivens*, in their Stirpes Kryptogamae Vogeso-Rhenanae, No. 434, and were referred by Spruce without question to his *C. multiflora*. But, according to K. Müller,[2] the specimens distributed under No. 434 represent *C. serriflora* Lindb. instead of *C. media*, and the description of Dumortier certainly applies better to *C. serriflora* than to the other species. In any case *C. lunulaefolia* seems to have been based on a mixture of species and it seems wisest to discard it altogether as K. Müller, Macvicar, and other recent writers have done. With regard to the status of *C. pallida*, first published as a species by Pearson, the views of writers vary, but there seems to be a strong tendency to regard it as a variety of *C. media*.

7. Diplophyllum gymnostomophilum Kaalaas, Vidensk-Skrift. I. 1898[9]: 4-9. *f. 1-4*. *Scapania gymnostomophila* Kaalaas, Bot. Not. 1896: 21. *Martinellia gymnostomophila* Arnell & C. Jensen, Bih.

[1] Hep. Europ. 93. 1875.
[2] Mém. de l'Herb. Boissier 6: 7. 1900.

Kongl. Svenska Vetensk. Akad. Handl. **21**[10]: 28. *pl.* –, *f. B.* 1896. *Diplophylleia gymnostomophila* K. Müll. Nova Acta Acad. Caes. Leop. Carol. **83**: 305. 1905. *Sphenolobus gymnostomophilus* Schiffn. Oesterr. Bot. Zeitschr. **58**: [3] 1908. On a limestone-bearing cliff, mixed with other bryophytes, Willoughby, Vermont (*Miss Lorenz,* July 1913). New to North America. In Europe the species is now known from Norway, Sweden, King Oscar Land, Scotland, and France (Basses-Pyrenées). It seems to be confined to calcareous regions and is everywhere rare. The Vermont plants, which bear gemmae but no sexual organs, agree closely with a Norwegian specimen collected by Kaalaas himself and kindly communicated by Miss Lorenz.

The original material of this interesting species was collected by Kaalaas in the vicinity of Christiania, although he cites specimens from other stations in Norway as well. It was entirely without archegonia but showed both androecia and gemmae. On account of the lack of perianths Kaalaas could not be sure about the generic position of his plant. He placed it in *Scapania,* at the same time expressing the opinion that it represented a transition between *Scapania* and *Diplophyllum.* A short time afterwards he discovered female plants with perianths. The latter were terete or only slightly flattened and showed numerous folds in the upper part and a contracted mouth. These peculiarities were naturally considered sufficient to exclude the species from *Scapania,* and it was therefore transferred to *Diplophyllum.* In this position it remained unchallenged until Schiffner pointed out the fact that it showed a relationship to *Jungermannia Helleriana* Nees and especially to *J. ovata* Dicks., two species which have caused considerable discussion among hepaticologists. At the present time *J. Helleriana* is regarded by most students as a species of *Sphenolobus* and is known as *S. Hellerianus* (Nees) Steph. With respect to *J. ovata,* however, opinions are still at variance. Some writers, including Schiffner, consider it a *Sphenolobus* and call it *S. ovatus* (Dicks.) Schiffn.; others include it among the species of *Diplophyllum.* Since Schiffner considers *J. ovata* a species of *Sphenolobus,* he naturally transferred *D. gymnostomophilum* to the same genus.

The genus *Diplophyllum* is exceedingly artificial and at the same time forms a connecting link between the genera *Scapania* and *Sphenolobus* and therefore between the subdivisions Epigoniantheae and Scapanioideae, which are usually placed rather far apart in arrange-

ments of the Hepaticae. In common with *Scapania* it has complicate, bilobed leaves with a sharp keel and unequal, variously spreading lobes; in common with *Sphenolobus* it has a more or less cylindrical perianth, contracted at the mouth and plicate in the upper part. Warnstorf [1] includes *Sphenolobus* under *Diplophyllum*. Stephani [2] excludes *Sphenolobus* but includes K. Müller's group *Plicaticalyx* [3] of *Scapania*. Warnstorf, therefore, emphasizes its relationship to the Epigoinantheae while Stephani emphasizes its relationship to the Scapanioideae. Typical members of the genus, such as *D. albicans* (L.) Dumort., are distinct enough from both *Spenolobus* and *Scapania*, if these genera are defined according to their characteristic representatives. But in *J. ovata* there is a clear link between *Diplophyllum* and *Sphenolobus*, and in *Jungermannia ferruginea* Lehm. (*Scapania ferruginea* Lehm. & Lindenb.), of India, there is an equally clear link between *Diplophyllum* and *Scapania*. Under the circumstances three courses are possible. The genus *Diplophyllum* might be given up altogether and its species divided up among *Sphenolobus* and *Scapania*. It might be reserved for its typical species, all doubtful forms being referred to *Sphenolobus* or *Scapania*. It might be more broadly understood and made to include both typical and doubtful forms, the artificial nature of the genus being fully recognized. Perhaps the last course would attract the most adherents. If this is followed, and to the writer it seems as good a course as any, both *Diplophyllum gymnostomophilum* and *Jungermannia ovata* might well be included under *Diplophyllum*.

With regard to the name of the genus Trevisan [4] substituted *Diplophylleia* for the older *Diplophyllum* of Dumortier [5] because the name *Diplophyllum* had been previously applied by Lehmann [6] to a genus of Scrophulariaceae. *Diplophyllum* Dumort. was therefore a homonym of *Diplophyllum* Lehm. Lehmann's genus, however, was never accepted by many botanists, being regarded as synonymous with the genus *Veronica* L., so that most of the older writers would have regarded Dumortier's use of the name *Diplophyllum*, in a sense entirely different from that of Lehmann, as quite justifiable. Un-

[1] Kryptogamenfl. der Mark Brandenburg 1: 156–162. 1902.
[2] Sp. Hepat. 4: 111–116. 1910.
[3] Bull. de l'Herb. Boissier II. 3: 36. 1903.
[4] Mem. Ist. Lomb. III. 4: 420. 1877.
[5] Recueil d'Obs. sur les Jung. 15. 1835.
[6] Berl. Mag. 8⁴: 2. 1814.

fortunately the International Rules of Botanical Nomenclature make no definite provisions for cases of this kind, although they advise that the use of homonyms be avoided in the future (see Recommendation V, b., on page 39). Among the amendments proposed by certain American nomenclature committees in 1909, there was one which provided for the absolute rejection of all generic names which were homonyms.[1] It was hoped that this amendment would be voted upon at the International Congress which met at Brussels in 1910, but unfortunately no such action was taken. The question of homonyms, therefore, remains unchanged, and there is no international rule of nomenclature which would prevent the use of the name *Diplophyllum* of Dumortier. In addition to *Diplophyllum gymnostomophilum*, the New England flora contains the following members of the genus: *D. albicans* (L.) Dumort., *D. apiculatum* (Evans) Steph.,[2] and *D. taxifolium* (Wahl.) Dumort. These three species are given under *Diplophylleia* in the writer's "Revised List of New England Hepaticae."[3]

Since *D. gymnostomophilium* is fully described and figured by Kaalaas and, more recently, by Nicholson,[4] only a few of its more important peculiarities will be discussed in the present paper. The plants are more or less tinged with yellowish brown and usually grow mixed with mosses. The stems are about 2 cm. long and are rarely branched. The ventral lobes of the leaves spread widely from the stem, often at more than a right angle and attain a size of about 1 × 0.6 mm. when well developed. They are oblong in form and more or less falcate, the curved lateral margins tending to be parallel. The apex is normally rounded, although the production of gemmae sometimes makes it more or less pointed. The dorsal lobes spread obliquely, at an angle of forty-five to sixty degrees; they are ovate in form and measure about 0.6 × 0.35 mm. The apex is commonly pointed and is sometimes apiculate. The margins of both lobes are entire throughout, and the sharp keel connecting them is usually distinctly incurved. In the ventral lobe the marginal cells measure about 14 μ in diameter, while the median cells measure about 22 × 16 μ. The latter tend to be arranged in longitudinal rows, but this arrangement is not always

[1] See Bull. Torrey Club **36**: 61. 1909.
[2] Sp. Hepat. **4**: 110. 1910.
[3] Rhodora **15**: 23. 1913.
[4] Jour. Bot. **51**: 158, *pl. 526, f. 1–6.* 1913.

apparent, and a false nerve is never differentiated as in *D. albicans.* The walls of the leaf-cells are slightly thickened, the trigones are small and often indistinct, and the cuticle is smooth or indistinctly roughened. The gemmae, which seem to be invariably present, are usually bicellular and vary in outline from oval to rhombic; they have thickened yellow walls and average about $28 \times 14\ \mu$ when well developed. The inflorescence is dioicous, the male and female plants growing separate.

A very close ally of *D. gymnostomophilum* is the arctic *D. incurvum* Bryhn and Kaalaas,[1] known from North Lincoln, Ellesmere Land, and King Oscar Land. This species is of about the same size but is more deeply pigmented so that it often appears brown. The leaves are relatively broader, the ventral lobe being broader than long, and the dorsal lobe is usually obtuse. In the common *D. apiculatum* of the eastern United States, the inflorescence is autoicous, and both ventral and dorsal lobes are pointed. It is further distinguished by the fact that the margins of the lobes are often denticulate or, in the apical portion, even dentate, although entire lobes also occur. The cells are a trifle smaller, averaging about $18 \times 12\ \mu$ in the middle of the ventral lobe.

Small sterile forms of *Scapania curta* (Mart.) Dumort. also resemble *D. gymnostomophilum* in certain respects. Usually, however, the margins of the lobes are more or less toothed, and the leaf-cells are a little larger, the marginal cells averaging about 17μ in diameter, and the median cells about $22\ \mu$. The latter, moreover, tend to be more isodiametric and show no indications of an arrangement in longitudinal rows. The trigones in *S. curta* are often conspicuous and the gemmae, although bicellular, average only about $20 \times 9\ \mu$, being thus considerably smaller than in the *Diplophyllum.*

The additions to local state floras, not already mentioned in the preceding pages, are as follows: —

For Maine. *Metzgeria pubescens, Cephaloziella Sullivantii, Chiloscyphus rivularis, Jungermannia cordifolia,* and *Lophozia Kaurini;* Round Mountain Lake and vicinity, Franklin County (*Miss Lorenz*).

For New Hampshire. *Calypogeia Sullivantii;* Passaconaway (*Miss Elizabeth Welsh*). *Cephalozia Francisci* and *Lophozia confertifolia;* Waterville (*Miss Lorenz*).

[1] Bryhn, Rep. Second Norwegian Arctic Exped. in the "Fram" **11**: 48. 1906.

For Vermont. *Pallavicinia Flotowiana, Calypogeia suecica, Cephaslozeilla byssacea,* and *Frullania Selwyniana;* Willoughby (*Miss Lorenz & A. W. E.*). Through an unfortunate oversight *Riccardia multifida* and *R. palmata* were not credited to Vermont in the writer's "Revised List"; both should have been marked with the sign "+."

For Massachusetts. *Jungermannia pumila;* Oxford (*Miss Greenwood*), included in the "Revised List."

For Connecticut. *Nardia Geoscyphus;* Bolton (*Miss Lorenz*).

The census of New England Hepaticae now stands as follows: Total number of species recorded, 181; number recorded from Maine, 128; from New Hampshire, 133; from Vermont, 117; from Massachusetts, 97, from Rhode Island, 77; from Connecticut, 135; common to all six states, 54.

Sheffield Scientific School, Yale University.

Viola emarginata in Massachusetts.— In his treatment of the violets in the seventh edition of Gray's Manual Doctor Brainerd gives the known range of *Viola emarginata* Le Conte as extending no further north than New Jersey. Some years earlier this violet had been attributed to New York on the strength of certain specimens from Staten Island that were then accepted as this species. But that was at a time of transition in our knowledge of violets when scarcely anyone was thinking of hybrid forms, Doctor Brainerd alone being in advance of the time, and these Staten Island specimens that looked like *Viola emarginata* turned out to be in reality crosses, some of them mixtures of *Viola Brittoniana* and *Viola sagittata,* and others hybrids of *Viola fimbriatula.* Subsequently, in 1910, the species was definitely added to the flora of New York, now actually from Staten Island, by Doctor Dowell, who collected it there first in 1907 (Bull. Torr. Club. **37**: 166).

It is rather singular that this violet has never been reported from Long Island, for it is common there, not only on the coastal plain but also in the hilly country north of the terminal moraine. So well distributed is it in southwestern Long Island, for a violet not to be classed among the most common kinds, that I have long believed it would yet be heard from in New England. It may now be recorded from Massachusetts, where it grows on Marthas Vineyard, attaining a very perfect foliar development but, apparently, not fruiting very

freely. I found it there September 23, 1913, well scattered along the thickety slope of a little valley among the hills in Tisbury south of Tashmoo Pond. Excellent specimens were collected, some of which have been sent to the herbarium of the New England Botanical Club.— EUGENE P. BICKNELL, New York City.

CONCERNING PHILADELPHUS PLATYPHYLLUS RYDB. — In the North American Flora, in his monograph of the Hydrangeaceae, Rydberg recognizes several segregates of *Philadelphus Lewisii* Pursh, some of which I identify with that species as synonyms. Among those which I examined was *P. platyphyllus* Rydb. from California. This seems to constitute a rather marked variety, distinguished by its broadly ovate to oval, sometimes nearly rotund leaves. The leaves of the type are exceedingly variable in size and shape, but rarely as broad as in the variety, and never subrotund, generally much smaller. (Extremes: Length 2.4–8.6 cm., breadth 1.3–5 cm.) The leaves of the variety are pretty uniform, mature ones varying from 4–7.5 cm. in length by 2.6–5 cm. in breadth. They are of a pale cast beneath, the outside pair of the five primary veins most often appearing faint. In the type the leaves are greener beneath, with 3 (in broad leaves 5) primary veins.

PHILADELPHUS LEWISII Pursh var. **platyphyllus** (Rydb.) A. H. Moore, n. comb.

P. platyphyllus Rydb. N. Am. Fl. xxii, 167 (Dec. 18, 1905).— ALBERT HANFORD MOORE, Washington, D. C.

ORONTIUM AT HYANNIS, MASSACHUSETTS.— Mr. John Murdoch, Jr., in RHODORA, XVI, 18, mentions the occurrence of *Orontium aquaticum* in Middleboro, Truro and Provincetown. I am glad to record its occurrence at Hyannis, where I first found it in August, 1905, and have observed it several times since. This station lies in a wet dune-hollow or small kettle-hole, very near the road which leads southeast from the village to the shore cottages. When I first found it there were only a few bent-over spadices with ripened fruit, but in June, 1909, I was fortunate enough to see the plant in full bloom. I have never seen *Orontium* growing elsewhere, and there are not over 25 plants at this station.— CLARENCE H. KNOWLTON, Hingham, Massachusetts.

Two Species New to Cape Cod.— Aira caryophyllea L. In a sandy field, Wellfeet, Massachusetts, Oct. 1, 1913. Nantucket has been the only station for this species in this state, from which its range extends for a long distance west and south.

Lactuca floridana (L.) Gaertn. Eastham, Sept. 29. 1913, Rather common in sandy soil near the bay shore in the northern part of the town. It is a tall, rather striking plant, with stout, straight stem, and with foliage showing more or less of a reddish shade. Long Island, New York has been the farthest point east and north hitherto recorded.

I am indebted to Prof. M. L. Fernald for determinations of these species; specimens have been deposited in the herbarium of the New England Botanical Club.— Frank S. Collins, North Eastham, Massachusetts.

The Nineteenth Annual Winter Meeting of the Vermont Botanical Club.— The nineteenth annual winter meeting of the Vermont Botanical Club was held in conjunction with the Vermont Bird Club at Burlington, January 30 and 31, 1914. The sessions were held in the Williams Science Hall, University of Vermont.

Eleven botanical papers were read and discussed, Dr. G. P. Burns of the University of Vermont presented a plan for doing ecological work on restricted areas, Mr. J. G. Underwood of Hartland gave a report of the activities of the local nature clubs of the state during the current year, and Dr. H. F. Perkins of the University of Vermont discussed the relation of nature clubs to the schools.

Other papers of interest were "Medicinal Plants" by Mrs. Evaline D. Morgan, of Woodstock, "A Nature Student in Labrador" by Miss Edith M. Estabrook of Boston, Mass. and "Notes on Some Orchids of Fairlee" by Dr. H. M. Denslow of New York, N. Y. Of special interest to the club was the story of the finding of the first station in western Vermont for the male fern, *Aspidium Filix-mas*, by G. L. Kirk of Rutland.

A fine supper complimentary to the visiting members was served at Grassmount Friday night, and in the evening a public lecture was given by Dr. Ezra Brainerd of Middlebury, on "The Blackberries of Vermont." Dr. Brainerd told of his conclusions reached after fourteen years study of the blackberry question and they were certainly interesting.

The summer meeting of 1914 is to be held at West Haven, with headquarters at Fairhaven, during the second week of July.

The officers elected are Pres. Ezra Brainerd, Middlebury; Vice-pres. W. W. Eggleston, U. S. Dep't. Agric. Washington, D. C.; Sec. Dr. George P. Burns, Burlington; Treas., Mrs. Nellie F. Flynn, Burlington; Editor of the Bulletin, George L. Kirk, Rutland; Librarian, Miss Phoebe M. Towle, Burlington.— NELLIE F. FLYNN.

THE FUNGI WHICH CAUSE PLANT-DISEASE. BY F. L. STEVENS.[1]— This volume of about 750 pages with 449 text figures is a companion to the author's "Diseases of Economic Plants" and "is intended to introduce to the student the more important cryptogamic parasites affecting economic plants in the United States, with sufficient keys and descriptions to enable their identification." The treatment includes the Mycetozoa and Bacteria, which occupy fifty pages, the rest of the book being devoted to the Eumycetes.

Professor Stevens has attempted the somewhat difficult task of combining in small compass a text book, a synopsis of the more important genera and families of the fungi, and a manual of plant diseases. General matters of reproduction and structure and even of cytology are taken up in connection with each main group. Keys are given to the genera, families, orders etc., and a very large number of forms are mentioned by name at least; while those of greater economic importance are in general fully treated, usually with figures and citations of literature. It has no doubt been a very difficult matter to decide which forms should receive full consideration and which should be passed over with scant mention or omitted entirely from an enumeration which aims to be so comprehensive as the present, and no two persons would probably agree in making such a selection. It is thus not always evident what has determined the choice of forms to be treated at length; as for example in the case of Echinodothis, which is given nearly a page, while various other forms of equal or much greater economic importance, receive scant reference or are omitted. The figures which are taken from various sources are sufficient and usually good. Mycologists will not, however, recognize *Clitocybe parasitica* in fig. 327. There is no separate host-index and no indication of the diseases referred to under host-names in the general index. Such an arrangement does not seem to be a very convenient one for a book to be used for ready reference. Under 'Oak' for example forty pages are cited by number, and again others under 'Quercus' some of which are not included under 'Oak.' The

[1] The Macmillan Co., New York, 1913. $4.00.

use of common names, only, for hosts is often confusing or inexact, as is usually the case in such a connection. The several lists of literature, cited in the text by consecutive numbers and following the main groups, appear to be full; but do not, as a rule, indicate the nature of the subject treated. The reviewer has not taken pains to verify any of the citations, and it is to be hoped that they have been carefully gone over; but the proof reading of the text has evidently been hastily done. In a cursory examination of the latter, several quite contradictory statements have been noticed, even in single sentences, and there are numerous errata, for the most part misspelled words. Although it is a question how usable this book will prove to persons who have not access to much fuller literature, it will assuredly be of great use to working phytopathologists as a convenient compendium of generally well selected matter relating to the economically more important fungi producing plant-diseases.— R. T.

Vol. 16, no. 183, including pages 45 to 56, was issued 23 March, 1914.

M. L. F. del.

ANNUAL HALOPHYTIC ASTERS OF THE MARITIME PROVINCES.

Rhodora

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SOME GRASSES NOTEWORTHY IN MASSACHUSETTS.

Eugene P. Bicknell.

Corynephorus canescens (L.) Beauv.

At Edgartown, Marthas Vineyard, out towards the water tower, there is a sandy sloping field, less than an acre as I recall it, a good part of which is covered by densely growing patches of this European grass. When it was first seen there, September 15, 1910, the panicles were dry and contracted, but it was easily recognizable as the same grass I had of late years collected at several places on Long Island and put aside for future study, supposing it to be some introduced species of *Aira*. Recently, at the New York Botanical Garden, specimens were shown to Mr. George V. Nash who recognized it at once as this European species, not previously reported from America, and pointed out to me the slenderly clavate awns of the flowering glumes by which it is readily distinguished from any species of *Aira*.

Since it has made itself perfectly at home at the places where it has become established, and thus promises to take its place more widely among our introduced grasses, the facts of its present status should be placed on record.

It was first met with on Long Island, June 27, 1903, growing in abundance on sandy levels along the southwestern side of the Hempstead Reservoir, and about its southern end, and was conspicuous from its densely tufted manner of growth, pale whitish green or violaceous color, and silvery panicles. On August 5, 1905, it was found, also in abundance, growing along the sandy causeway of the Ridgewood acqueduct, south of Jamaica, about seven miles to the west of the Hempstead locality. Still another station is at Cedarhurst, about five miles distant from each of the others, and nearer

the south shore of the island. Here, on June 25, 1911, it was only just in bloom, and in many of the tufts the panicles were only beginning to show. It was in full flower on Long Island, July 4, 1903, and July 11, 1911, and on Marthas Vineyard, July 7, 1913.

Elymus australis Scribn. & Ball.

On Chappaquiddick Island, Marthas Vineyard, this grass grows sparingly among low shrubbery along the top of a high bluff overlooking Katama Bay. Collected September 13, 1910, then mostly dried and brown, but still erect, the largest spikes 15 cm. long. Agrees perfectly with authentic material in Herbarium of the New York Botanical Garden. Apparently not reported hitherto from north or east of Connecticut.

Panicum barbipulvinatum Nash.

Collected on Marthas Vineyard, October 1, 1909, in a boggy spot at the north end of Sengekontacket Pond; only a few plants were found. Determined at the New York Botanical Garden by Mr. George V. Nash and Doctor P. L. Rydberg.

This *Panicum* appears not to have been recorded from east of Illinois and Wisconsin; yet it has every appearance of being indigenous on Long Island, where it grows, often in luxuriant abundance, in damp places along the shore or among the sand dunes, on the Rockaway Peninsula and at Long Beach. It comes into flower late (no panicles fully expanded September 5, 1909) and continues to bloom until killed by frost.

Panicum scoparium Lam.

Abundant on a dry level tract near the shore south of the herring run at Great Pond, Marthas Vineyard. When first discovered there, October 6, 1909, it was mostly dried and brown, but had passed a season of vigorous growth. The following year, on September 19, much better specimens were collected bearing fresh and very numerous secondary panicles, the primary panicles having lost all their spikelets.

Has previously been reported from Massachusetts, at Cape Cod, (Hitchcock & Chase, Cont. Nat. Herb. **15**: 295, 1910).

Tridens flavus (L.) Hitch.

Abundant on a low grassy knoll flanked by trees and thickets on the west side of Sengekontacket Pond, Marthas Vineyard. In full flower, September 29, 1909.

This grass appears not to have been known from Massachusetts

previous to its discovery on Nantucket in September, 1907, where it was probably introduced (Bull. Torr. Club **35**: 195, 1908). Subsequently it was reported as having been found in Southboro, in August, 1909 (Arthur J. Eames in RHODORA **12**: 205, 1910).

It cannot be said positively that this grass was not adventive on Marthas Vineyard, but there was nothing in the manner of its occurrence there to suggest that it was not of the indigenous flora.

NEW YORK CITY.

OLD-TIME CONNECTICUT BOTANISTS AND THEIR HERBARIA,—I.

C. A. WEATHERBY.

JOHN PIERCE BRACE.—To claim Mr. Brace as a botanist is, perhaps, to make an unjustifiable raid on the other fields in which he was, more notably, active. Teacher, editor, author, amateur in most of the natural sciences and well-versed in "such out-of-the-way subjects of investigation" as "heraldry, astrology, the decyphering of cyphers and composing of music," his botanical interests formed but one facet, and that a small one, of a many-sided mind. Nevertheless he did publish the earliest local flora of any part of Connecticut; all his life he carefully kept an herbarium and for most of his life continued to add to it; and, according to the writer of his obituary, "....flowers were his pleasure almost in his dying moments and the last names he forgot were the botanical." In so far he must be classified as a botanist.

John Pierce Brace was born in Litchfield, Feb. 10, 1793, a descendant of Stephen Brace who settled in Hartford in 1660. His aunts, the Misses Pierce, proprietors of the Litchfield Female Academy, superintended his education and sent him to Williams College, where he graduated in 1812. Thereafter he lived for some twenty years at Litchfield, most of the time, apparently, as teacher at the Academy, a school famous in its day and one which attracted pupils from far and near, though its "plant" consisted of a single small building containing one plainly furnished class-room. In 1816, he was one of seven young men who clubbed together to purchase the memorable stove, the heat

of which, on the Sunday when it was first set up in church, caused such discomfort to the older and more Spartan members of Dr. Lyman Beecher's congregation — until they discovered that there was no fire in it. It was during this period that Mr. Brace's interest in natural history seems to have been most keen.

In 1820 he married Miss Lucy Porter, a sister of the second Mrs. Lyman Beecher. In 1833 he moved to Hartford to become principal of another well-known school of that time — the Hartford Female Seminary. As a teacher, he seems to have possessed unusual ability. One of his pupils was Harriet Beecher Stowe, who afterward took him as the original of "Rossiter" in "Old Town Folks." There, and in a letter of reminiscence printed in Lyman Beecher's Autobiography, may be found an interesting account of his methods and personality. He was especially good in English composition. He needed to be, to arouse in a girl of nine, even one who was destined to become a writer of prominence, any enthusiasm for the subjects which in those days were wont to be assigned for the puzzlement of youthful heads — "The Difference," for instance, "between the Natural and Moral Sublime." But Mrs. Stowe testifies that he accomplished it.

Mr. Brace's name appears in successive Hartford directories as principal of the Female Seminary until 1846. Then, for a while, he lived in New Milford; and about this time he may have written the novels, one of which was published in 1847 and another, a tale of the early days of Hartford, in 1853. About 1850 he became editor of the Hartford Courant. His successors testify that he made an excellent editor, even as he had made an excellent teacher. Certainly, his editorials show a humor and a quaint way of mingling classical allusions and colloquialisms which makes them, even today, by no means unentertaining reading. For years, we are told, he was able to do all the work required to fill the columns of his daily issue, "the editorial variety being small and city or local news only such as accidentally found its way to the office." That office was in an old attic room, "filled with books on all sides — a valuable library, too — and everything in it covered with dust and cobwebs." Doubtless this is the room to which his niece, Mrs. Asa Gray, used to climb when she stopped over in Hartford in the course of annual visits to her relatives in Litchfield.

Mr. Brace remained editor of the Courant during the ten years of gathering political passion which preceded the Civil War. In 1861

he retired, being then, as one of his successors informs us, "looked upon as a very old man." Afterward, however, he was married a second time (his first wife had died in 1840) to Miss Louisa Moreau; and returned to Litchfield, there quietly to spend his last years. He died Oct. 18, 1872.

In the preface to his "Flora of the Northern and Middle States," Dr. Torrey includes Mr. Brace among the botanists for whose assistance he makes acknowledgment, and cites his specimens and notes some dozen times in the body of the work. But, so far as I am aware, Mr. Brace's own published botanical work is confined to the "List of Plants growing spontaneously in Litchfield and in its Vicinity," which appeared in Silliman's Journal in 1822. This list contains an extraordinary number of misprints; but, in spite of such superficial disfigurement, remains a good record of personal observations at a time when the maker of a local flora, were it no more than a bare catalogue, could still be a pioneer. Mr. Brace was an amateur and knew his limitations. He attempted no changing of names nor descriptions of new species. In these matters, he was evidently guided by his correspondent, Dr. Torrey. He records 453 species with the habitat, time of flowering, color of flowers and frequency of occurrence, of each. In the case of the rarer species, definite localities are often given. Such a list is always of interest to students of a local flora, for the bits of evidence it gives as to the history and spread of introduced species and as to changes in floristic conditions; and, sometimes, for its omissions. The most significant of these, in the case of Mr. Brace's list, is *Marsilea quadrifolia.* To botanists of the present generation, the Bantam Lake station for that species is classic, as the single one in North America where the plant may be native. But it was evidently unknown to Mr. Brace: indeed, the earliest mention of it I can find is in the addenda to the fourth edition of Gray's Manual, published in 1863. The station at Cromwell, Conn., which has existed, unknown to fame, for at least forty years, may be as old.

Rossiter, in Old Town Folks, "had a ponderous herbarium of his own collection and arrangement over which he gloated with affectionate pride." Doubtless this is literally enough true of Mr. Brace; and an added interest is given to his list by the existence of his herbarium which is still preserved at Williams College. There, through the kindness of Professor Clarke, Mr. C. H. Bissell and the writer were recently permitted to examine it. It is somewhat shrunken from Ros-

siter's which "filled forty or fifty folios" — twenty-eight is the actual number — but still of goodly size, containing some seven thousand sheets. They are chiefly of flowering plants and ferns, but there are a number of mosses, lichens and algae, and one mushroom — a species of *Boletus*. The plants are mounted on separate sheets of about foolscap size, are arranged systematically according to the older editions of Gray's Manual and are kept in leather-backed portfolios evidently made especially for them. They show every evidence of having been well cared for, both during Mr. Brace's life and since. The specimens are brittle from age but otherwise in first-rate condition. Most of them have been poisoned and the damage done by insects is negligible. They are mounted on various kinds of paper — whatever came handy: half sheets of foolscap, leaves from old account-books, pieces of plain white or bluish paper — and are attached to the sheets in equally various ways. Some are sewed, some are glued, some are held in place by strips of gummed paper and some by strips of plain paper secured at the ends by the red adhesive wafers with which our grandfathers sealed their letters — a method which adds brilliancy to the color-scheme of an herbarium but is not otherwise to be recommended. According to present-day standards, many of the specimens would be considered rather fragmentary, but they are carefully prepared and usually sufficient to show the distinctive characters of the species concerned.

Besides Mr. Brace's own collections, the herbarium contains many specimens, both North American and foreign, from other collectors. Among American botanists, Oakes, Sullivant, Charles Wright (his first Texas collection), Asa Gray, Ravenel, Ives, Torrey, B. D. Greene, Dewey, Cooley, Olney, Nuttall, Darlington, Short, Elliott, Bigelow and Barratt are represented by one or more specimens. And there are numerous foreign ones, chiefly from Europe. Several specimens, mostly of introduced plants, are of interest to Connecticut botanists. *Sisymbrium Sophia*, recorded in the Catalogue of Connecticut Plants only from a recent collection at Naugatuck, Mr. Brace has from New Haven. *Senecio vulgaris* from Hartford, considerably antedates any collection from the state hitherto recorded. *Ballota* "*nigra*," naturalized near New Haven," is doubtless considerably earlier than the Eaton collection listed in the Catalogue. *Rynchospora fusca* from Norfolk is not otherwise known from the northwestern part of the state. A sheet labelled: "Grasses found in my front yard at 224 Main St.,

Hartford, July, 1861" contains two species, one *Lolium perenne,* the other *Cynosurus cristatus.* The latter is one, and by far the earlier, of two known collections from the state. The Hartford station has long been extinguished under shops and paving-stones but the record is interesting.

The enquirer who seeks to learn from Mr. Brace's own collections the actual basis for some doubtful reports in his list and the significance of some names which because of nomenclatorial or other changes, are no longer clear, will meet with some disappointment. In Mr. Brace's day, the usefulness of an herbarium as a record of distribution had not been perceived: its sole function was to preserve representative examples of different species. Other information could be relegated to a note-book. Mr. Brace proceeded strictly on this theory. Of most species he has kept only one specimen; three is the maximum. If he had a good specimen of, say, the dandelion from Europe, he did not think it necessary to preserve a Litchfield specimen also, though he would sometimes write "found here" on a foreign sheet. And he did not, as a rule, record date and place of collection. The result is that, of the 453 species recorded in his list, just thirty are represented in the herbarium by specimens definitely marked as from Litchfield. It is, however, possible by various processes of higher criticism, to make out what specimens are probably from Litchfield and to determine with some degree of certainty, the identity of the plants Mr. Brace really had, in cases where the list leaves us in doubt. In addition to the thirty marked as from Litchfield, fifty-four bear statements of habitat, often differently phrased from those in the list, but usually essentially the same, which would indicate that these plants had come under Mr. Brace's eye. In two cases,— *Scirpus validus* and *Eriophorum callitrix* — this conjecture is borne out by the presence in the Torrey herbarium at New York of duly labelled Litchfield specimens; and in one — a rather marked form of *Scirpus occidentalis* — by the collection, during the past summer, of identical material at the locality — Dog Pond, Goshen — given in the list. Also, though Mr. Brace was careless as to his own specimens, he usually provided some inscription, such as "Middle States," "from Prof. Dewey" or the like, on those he received from others. Finally, he numbered, not so much his specimens as his species — all plants of the same species, if there were more than one, receiving the same number. This numbering evidently began with the spring collecting of some

particular year — *Symplocarpus foetidus* is no. 1, *Alnus incana* 2, *Epigaea* 3 — and continued chronologically, each species receiving its number consecutively, as it was obtained. It is possible, roughly, to follow spring, summer and autumn flowers through successive years. The starting point of the series seems to have been the spring of 1818. A fly-leaf from an old account-book is used as a mounting-sheet and on the back of it is written: "Plants collected in Litchfield in 1818." Other similar sheets, bearing on their backs the names of plants, statements of habitat and dates of collection, numbers (always low) and the marks of specimens which have been removed, reinforced by a reference to "my old Herbarium" in a note of Mr. Brace's, show that he originally kept his material in large blank-books, putting as many specimens (and species) on each page as it would hold and inserting them as collected. Later, when he wished to make a systematic arrangement, these specimens were taken out and either remounted or replaced — and much data, which we should now like to have, was lost in the process.

One specimen, marked as received in December, 1824, is numbered 1960. With these clues to the chronology of the numbers, it is possible to figure roughly what number a given specimen should bear to have been collected and in Mr. Brace's hands before the date of the list, 1822. It should be below 1400 — the great majority are actually below 1300. If then we find a plant not definitely marked as from elsewhere, numbered below 1400 and bearing a name used in the list, there is a good probability that it was collected by Mr. Brace at Litchfield, and a better one that it shows what he meant by the name used. It may do this, even it were collected by some one else.

This method does not work with entire smoothness, nor always with satisfactory results. *Gratiola virginiana*, for instance, is described in the list as having purple flowers. One would guess that this came from confusing *Ilysanthes*, which is not in the list at all, with *G. virginiana* of Elliott, which is described as purple-flowered, and that true *G. virginiana* would be the plant listed as *G. neglècta* Torr. But the specimens of *G. neglecta* and *G. virginiana* in the herbarium under different numbers, are both good *G. virginiana; Ilysanthes* appears under the name, *Lindernia*, which it usually bore in the earlier floras; and we are left with nothing but our original guess. And specimens from other collectors will not do at all in critical cases. The record which we should most like to verify is that of *Isanthus brachiatus.*

The claim of that species to admission to the Connecticut flora rests on Mr. Brace's list and a specimen of Charles Wright's at the Gray Herbarium. The latter is marked as from Wethersfield, but the accuracy of its label is under suspicion. Mr. Brace's single specimen is *Isanthus* without doubt; but it was collected in Ohio by Sullivant. One can hardly base a Connecticut record on such evidence; someone will still have to collect *Isanthus*.

Nevertheless, even the most data-less portions of the herbarium may be made to yield some evidence as to doubtful points; and it is possible to dispose satisfactorily of all but one of the Brace records in the list of excluded species in the Catalogue of Connecticut Plants. *Thaspium aureum* and *Gentiana Saponaria* are, as would be supposed, *Zizia* and *G. Andrewsii* respectively. *Ranunculus Flammula* is *R. laxicaulis; Euphorbia dentata, E. hirsuta; Pycnanthemum aristatum, P. muticum.* The one exception is *Veronica Beccabunga* of which Mr. Brace has only a European specimen. The species is reported as introduced at a few localities in North America; but it is altogether probable that what Mr. Brace had was *V. americana.*

The following list of species represented in the Brace herbarium by specimens definitely marked as from Litchfield is appended in the hope that it may be of interest to students of the local flora. In each case, the name first given is that used in the Brace list; where this has been superseded in present-day usage, it is followed by its current name or by that of the species to which the plant in question is now referred.

Acorus Calamus.

Agrostis mexicana. Of the two plants on sheet no. 1384, one is *Muhlenbergia tenuiflora*, the other, marked Litchfield, *M. mexicana* — the only specimen of that species I have seen from Litchfield County.

Alopecurus geniculatus. Plant is the var. *aristulatus.*

Arundo canadensis. Calamagrostis.

Callitriche heterophylla.

Carex flava.

Comptonia asplenifolia. Myrica.

Convallaria bifolia. Maianthemum canadense.

" *pubescens. Polygonatum biflorum.*

" *racemosa. Smilacina.*

" *umbellulata. Clintonia borealis.*

Cornus circinata.

Eriophorum virginicum. "Cranberry Pond swamps."

Festuca. Mentioned in a foot-note in the list as "a new species of *Festuca* differing from *F. fluitans* in having acute glumes." *Glyceria acutiflora.*

Gentiana quinqueflora.

Juncus effusus. Plant is var. *solutus.*

Milium pungens. Oryzopsis. "Top of Mt. Tom." The only collection from west of the Connecticut River.

Orchis ciliaris? Habenaria blephariglottis. "Cranberry Pond Swamp." Not now known from that locality.

Orchis psycodes. Habenaria.

Osmunda spectabilis. O. regalis.

Poa trivialis. P. triflora as to the Litchfield plant. Another on the same sheet "from Cooley" is good *P. trivialis.*

Potentilla floribunda. P. fruticosa.

Prunus depressa. P. cuneata. "Top of Mt. Tom."

Utricularia cornuta. "Cranberry bog."

Uvularia sessilifolia.

Veronica arvensis.

" *sentillata.* A misprint for *V. scutellata.*

" *serpyllifolia.*

Xyris jupicai. X. caroliniana.

In addition, there are the two specimens at New York mentioned above, and in the Brace herbarium one sheet of *Muhlenbergia sobolifera* and one of *Clethra alnifolia.*

For some reason, the two latter species are not included in the list.

East Hartford, Connecticut.

The Twentieth Annual Field Meeting of the Josselyn Botanical Society of Maine will be held at Van Buren, July 14–18, 1914, with headquarters at the Hotel Hammond. Further notice, with program, will be sent to members, and to any persons interested, on request, at least two weeks previous to the meeting.— Dana W. Fellows, Secretary, Portland, Maine.

TWO YELLOW-FRUITED SHRUBS.

G. S. Torrey.

Among the plants sent for determination to the Gray Herbarium during the past autumn, are two color variations which seem sufficiently striking to merit recognition as forms of their respective species.

On October 4, 1913, Mrs. Frank E. Lowe collected in Shrewsbury, Mass., specimens of the spice bush, *Benzoin aestivale* Nees., which differed from the common form in having the drupes orange-yellow, instead of bright red. Several bushes were found, some growing with the typical form in low, damp places; some alone, in drier ground in a rocky pasture. These all bore yellow berries only, which were ripe and falling. The material was sent by Mrs. Lowe to Mrs. E. L. Horr of the Worcester Natural History Museum, by whom it was referred to the Gray Herbarium. The plant may be characterized as follows:

Benzoin aestivale (L.) Nees., forma **xanthocarpum**, forma nova, fructibus flavis.

The type specimen is in the Gray Herbarium, and a specimen has also been deposited in the Herbarium of the New England Botanical Club.

On November 1, 1913, Miss Louise H. Handy collected specimens of a yellow-fruited beach plum in Marion, Mass., which she sent to the Gray Herbarium. Other material of the same collection reached the Herbarium through Mr. E. W. Hervey of New Bedford, to whom it had been sent by Dr. B. J. Handy. Miss Handy writes that several score of the yellow-fruited bushes grow on a point which runs out into Buzzards Bay, the fruits of which are picked every year by the townspeople for jam.

Although there is no material of this form to be found in the Gray Herbarium, this is not the first time that yellow fruit has been reported in *Prunus maritima*. The species has long been known to be extremely variable; and Prof. Macfarlane of the University of Pennsylvania, who has made a detailed study of the nature and range of the variations,[1] is able to sort the fruits into twelve groups according to color

[1] The Beach Plum, Viewed from Botanical and Economic Aspects. By J. M. Macfarlane. Trans. Bot. Soc. Penn. i. 216 (1901).

and size. He finds that about 65% of the plants have black-blue fruit, while in the remainder, the color passes to bluish green and to a clear orange-yellow. Although Prof. Macfarlane does not consider any of these types sufficiently well-marked to receive names, it seems desirable as a matter of convenience to recognize as a form so conspicuous a variation as the one in hand.

There seems to be no reason why we should not date our *Prunus maritima* from Marshall's description in the Arbustrum Americanum, published in 1785, rather than from that of Wangenheim, as has usually been done. Marshall's description is brief; but there can be no doubt that he was dealing with the plant which Wangenheim published two years later under the same name. *Prunus maritima* Wang. therefore becomes a synonym of *P. maritima* Marshall, and the yellow-fruited form may be called:

Prunus maritima Marshall, forma **flava**, forma nova, fructu flavo. The type specimen is deposited in the Gray Herbarium.

Gray Herbarium.

THREE LUPINES NATURALIZED IN EASTERN CANADA AND NEWFOUNDLAND.

M. L. Fernald.

In 1911, while botanizing at Clarenville, at the head of Trinity Bay in Newfoundland, the writer was surprised to see a tall Lupine completely occupying the available ground in a cemetery. So thoroughly established was the plant that it obscured many of the graves and their stones, and only the strong fence had kept from the area the browsing animals which had devoured the tops of all the plants outside the enclosure. A single specimen only was secured by reaching through the fence, for the watchful populace was of a class and disposition to make one think twice before vaulting the cemetery fence to dig up the flowers growing within.

Later, upon returning to Cambridge, the writer received for determination from Dr. J. M. Macoun a specimen of a Lupine seemingly identical with the one at Clarenville but collected on a roadside at

Chebogue Point, Nova Scotia, by Mr. C. H. Young. The plant was clearly not any of the species of eastern America nor of Europe so that, in view of the almost hopeless difficulty of determining the species of western North America without prolonged study, the Newfoundland and Nova Scotia material was pigeon-holed.

But the eastern botanist is apparently not to be allowed to leave the difficulties of untangling the Lupines to his western colleagues, for the western Lupines are obviously becoming naturalized in the East. In August, 1912, Messrs. Long, St. John and the writer found a colony of a gigantic Lupine growing in a sandy thicket along Brackley Point Road on Prince Edward Island. The plant was in ripe fruit, only one small inflorescence showing lingering flowers, so an appeal was made to the Prince Edward Island botanist, Mr. L. W. Watson, to secure flowers the following season. Mr. Watson, naturally assuming that the roadside station referred to was, as his letter says, "an extension of that which overruns Sherwood Cemetery, not far from Brackley Station," secured flowering material from there. But upon study it quickly becomes apparent that the plant overrunning Sherwood Cemetery is not the same as that occupying the roadside thicket farther north, but that it belongs to a different section of the genus.

With the aid of Dr. B. L. Robinson, the writer has attempted to identify the three plants which are establishing themselves in the Maritime Provinces and Newfoundland. They are all species native of western North America which have been cultivated in European gardens and introduced into eastern British America for their ornamental value. The tendency they are showing to spread rapidly and to go beyond the bounds of the garden indicates that they may be found at other stations; and, since these are only three of the innumerable attractive Lupines which have been cultivated, it is not improbable that they are merely the forerunners of a considerable naturalized Lupine-flora to be expected in the regions where they are so readily establishing themselves.

The three species, which are all perennials, may be distinguished as follows:

Lupinus albicaulis Dougl. Rather slender, branching, 0.5–1 m. high; the upper part of the stem and the rhachis silky or slightly velutinous: leaves with 5–9 oblanceolate somewhat silky leaflets 2.5–4.5 cm. long: stipules linear, 3–8 mm. long, early deciduous: primary racemes becoming 1.5–3 dm. long: keel bent almost at right

angles, very slender, soon exposed to view for half or two-thirds its length: lateral petals 4–6 mm. broad.— Native of the coast region from Washington to California; becoming naturalized on Prince Edward Island: overrunning Sherwood Cemetery, near Brackley Station, *L. W. Watson*, July, 1913.

L. nootkatensis Donn. Stout, subsimple or branched, 3–6 dm. high: stem and petioles loosely and densely villous: leaves with the 6–8 oblanceolate mucronate leaflets 2.5–5.5 cm. long, densely villous beneath, rather villous above: stipules linear-setaceous, 1.5–3 cm. long, persistent: raceme becoming 1–3 dm. long: keel broad and gradually curved, not much exposed: lateral petals 8–11 mm. broad.— Native from Alaska to Vancouver Island; naturalized in Newfoundland and Nova Scotia. Newfoundland: very abundant and overrunning the cemetery, Clarenville, August 19, 1911, *Fernald & Wiegand*, no. 5784. Nova Scotia: roadsides, Chebogue Point, May 29, 1910, *C. H. Young*, Herb. Geol. Surv. Can., no. 81,283.

L. polyphyllus Lindl. Stout, simple, 7.5–12 dm. high: stem minutely and sparingly pubescent or glabrate: lower leaves on petioles 3–7 dm. long: leaflets 10–17, oblanceolate, acuminate, 6–14 cm. long, 1.5–3.5 cm. broad, glabrous or sparingly pilose: racemes becoming 2.5–6 dm. long: keel hidden, broad and gradually curved: lateral petals 6–8 mm. broad.— Native from western British Columbia to California; naturalized on Prince Edward Island: dry thickets and banks along Brackley Point Road, August 1, 1912, *Fernald, Long & St. John*, no. 7678.

Gray Herbarium.

VIOLA SELKIRKII IN COLORADO.

E. R. Cross.

In the summer of 1912 I received from Mr. C. F. Leach of Sedalia, Colo., a few pressed leaves of a violet new to me. It seemed so obviously related to the group of small white-flowered *Violae*, that I was at first inclined to identify it with *Viola blanda* Willd. Later fruiting specimens and the discovery of large numbers in blossom the following spring proved it to be *V. Selkirkii* Pursh, a species not before accredited to Colorado.

So far as I have been able to discover, its occurrence in this region is extremely local. The three known colonies are miles apart with prominent watersheds intervening, and probably mark for the species

its southernmost limit on the continent. One can but suppose that these stations indicate, as in the analogous case of *V. biflora* L., a once far more general distribution, of which the connecting links have been destroyed.

The profusion of some of our mountain violets is almost beyond belief to one who has not actually witnessed it. The principal colony of *V. Selkirkii* on Garber Creek extends for over two miles, the plants being packed so thickly in places that the ground looks purple with their blossoms. In one locality within a radius of sixty paces no less than seven distinct species are found, as follows, naming them in decreasing order of abundance:— *V. Selkirkii*, *V. renifolia* var. *Brainerdii* (Greene) Fernald, *V. nephrophylla*, *V. rugulosa* Greene, *V. adunca* Smith, *V. Nuttallii*, and *V. pedatifida;* and near the head waters of this same stream *V. palustris* L. covers the wet soil as with a carpet.

The favorite haunts of *V. Selkirkii* in our region appear to be on sloping banks, never very far from water, and under the shade of *Pseudotsuga mucronata* and *Picea pungens*. Here it occasionally reaches a height of six inches or more, and is often found in company with the two other old-world *Violae*, *V. biflora* and *V. palustris;* though it does not occur with them at subalpine elevations. The following table may explain the relative scarcity of the three species, tallying as it does with their lack of the natural facilities for propagation:—

V. palustris	stolons	common,	cleistogamous	flowers	common;
V. Selkirkii	"	none,	"	"	common;
V. biflora	"	none,	"	"	none.

It is difficult in the case of such a markedly distinct species as *V. Selkirkii* to suggest definite affinities. The fact that the cleistogamous capsules are splotched with dark purple, the stalks often reddish-streaked, would seem to indicate that it has heretofore been placed too close to *V. palustris;* and that it belongs more properly to the *blanda-renifolia* alliance. The prominent spur and the conspicuous long auricles at the base of the sepals are strongly suggestive of the *caninae;* but the stigma is very different. One peculiar feature, which I do not remember to have seen mentioned, is the bracteoles, which at least in the cleistogamous scapes are linear and blunt (almost 'squared off') with an abrupt sharp point.

Denver, Colorado.

Unusual Plants found in Salisbury, Connecticut.— On March 30, 1913 *Daphne Mezereum* L. was well in blossom. This plant was first brought to my attention about six years ago when a student brought a small twig for identification. Search revealed only three small shrubs. It has increased until now there is quite a large colony on a disintegrating limestone ledge and there are many scattering plants in the vicinity. I am told by Miss Mary Seymour that in the town of Norfolk *Daphne Mezereum* L. is so abundant as to make a very conspicuous color-spot on the hillsides when it is in blossom.

Rumex mexicanus Meisn. was first found four years ago in a mowing lot on the Wells Hill Road. It still persists in that field.

Anthriscus Cerefolium (L.) Hoffm. persists abundantly as a weed in a garden. It has been known there for many years.

In the same yard *Veronica Chamaedrys* L. has established itself in the lawn. It is not grown as a garden plant nor has it been for years.

Equisetum pratense Ehrh. is very abundant on both sides of the Central New England railroad north of Lakeville.— Orra Parker Phelps, Canton, New York.

Spiraea salicifolia in Alburg, Vermont.— Mr. Sidney F. Blake, in Rhodora, xvi, 40 (1914), records the first discovery of *Spiraea salicifolia* L. in New England, at Swanton, Vermont, Aug. 24, 1911. Knowing of Mr. Blake's find, I have kept looking for this species in northwestern Vermont, but not till last summer, Aug. 26, 1913, did I succeed in finding it. All along the Rutland Railroad from Burlington northward I kept my eyes open for this bush, but not till the train reached the Alburg peninsula did I detect it from the car window. For once the train stopped opportunely, and I secured fairly good specimens, rather past flowering.

There seems to be a great deal of this species in Alburg, mostly in swampy places and I did not notice any *Spiraea latifolia* Borkh. The soil of the peninsula is largely marine clay, and geographically the region is like the broad Canadian plain at the north. It is only a short distance across Missiquoi Bay to the Swanton station for the plant. In appearance the bush is rather taller than our familiar meadowsweet, and the new growth is made up of many wand-like shoots which suggest the willow even more than do the numerous narrow leaves.— Clarence H. Knowlton, Hingham, Massachusetts.

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WILLIAM WHITMAN BAILEY.

WALTER DEANE.

ONE by one our older botanists are leaving us and their places are being taken by the younger generation in their turn. We miss the familiar faces, the spoken and the written words, and the warm friends who have cheered and encouraged us in our pursuits. But we must rather rejoice than mourn when a life filled with much suffering in the midst of botanical activity has at last been ended and the body is at rest.

William Whitman Bailey died in Providence, Rhode Island, on February 20, 1914, within two days of 71 years of age. He was born at West Point, New York, on February 22, 1843, and was the son of Jacob Whitman Bailey of West Point and Maria Slaughter, daughter of Samuel Slaughter of Culpeper, Virginia, through whom he was connected with many prominent Virginians. He was descended from John Bayley, of Newbury and Salisbury, Massachusetts, who emigrated from Chippenham, England in 1635. His father was born in Ward, now Auburn, Massachusetts, in 1811, and was graduated at West Point in 1832 where, after serving for some years in the First Artillery, he became in 1838 Professor of Chemistry, Mineralogy and Geology. There he remained till his death on February 26, 1857, a man in the very front of American science and a leader in microscopical research. Bailey's great grandfather on his mother's side was Colonel James Slaughter of Virginia who served in the Continental Army.

Young Bailey's early life was spent at West Point. He writes later, "My very earliest memories were associated with the military life at West Point. I never knew any other till I was fourteen years

of age. The daily routine of the Post was familiar to me, the reveille, guard mounting, hour calls, parade, gun fire, drills of all kinds, tattoo and taps. I was acquainted with the minutiae of the Academy, as a child would observe." This, with his short military service mentioned later, accounts for the intense military ardor that he always showed, and his deep love for West Point.

A terrible tragedy came into Bailey's life when he was but nine years of age and he never entirely recovered from its effects. On July 28, 1852, he embarked with his father, mother, and only sister, a young girl of sixteen, on board the Henry Clay, on the Hudson River, near West Point, for Long Island. The weather was bright and warm, and they had proceeded as far as Yonkers when the cry of "Fire!" was heard. Space forbids details. The fire was amidships. The steamer was beached near Yonkers and the passengers forward could escape, but the retreat of Prof. Bailey and his family was cut off. They all finally sprang into the water and in spite of every effort Mrs. Bailey and her daughter were drowned, Professor Bailey and his son were saved. From the shock there received young Bailey's life trembled in the balance for several years, and his whole life and nature were profoundly affected by the calamity. Long after he writes, "After the dread event and consequent shock I never regained my original tone." Indeed all the events of his future life were dominated by his weak constitution.

In February, 1857, but a few days before his father's death, he left West Point and went to Providence which was the residence of his uncle and where some of his ancestors had lived for several generations. He entered the University Grammar School and in 1860 became a freshman at Brown University in the same city. Having a profound distaste for mathematics and finding great difficulty with the subject he drifted into a special chemical course and left college with his class, but without a degree.

It was during his college career, in 1862, at the time of the Civil War that he enlisted as a private in the Tenth Regiment of Rhode Island Volunteers for three months. His health broke down under the exposure, and he returned to Providence before the regiment. From time to time after graduation Bailey visited, at Fredericton, New Brunswick, his brother, Professor Loring W. Bailey, who held the chair of Chemistry and Natural Science in the University of New Brunswick in that city, and on several occasions he assumed his

brother's duties, teaching Chemistry, Physiology, and Comparative Anatomy. In 1866 and 1867 he was assistant chemist in the Manchester Print Works, Manchester, New Hampshire, and in the Massachusetts Institute of Technology, in Boston.

Up to this time Bailey did practically no botanical work. While in college he amused himself occasionally with the systematic analysis of simple plants. It was a mere amusement, botany not being taught at that time at Brown University. He says, "While in college and for some years after I regarded chemistry as my ultimate goal." In 1867 he heard of the United States Geological Exploration of the 40th Parallel under Clarence King, and he was informed that a botanist was wanted. He immediately sought the position, and, on writing to Dr. Asa Gray, he received the amusing reply, "Mr. King desires a young man who shall at the same time be an accomplished botanist. As the two things are incompatible I think you'll do as well as another." Bailey accepted the position and from that time devoted himself to botany, never returning to chemistry. He started immediately for his new field of action. Here again he broke down and, in the spring of 1868, Dr. Sereno Watson took his place. In a letter to the writer he says, "I was with the party in Nevada about nine months when my health failed and I resigned. Still for a tyro my work was not so bad. Watson told me that he adopted my sketch of the phytographic regions in his report."

For several years after this he was engaged in various occupations, at one time assistant librarian at the Providence Athenaeum, and again teaching in private schools, and working in the herbarium of Columbia College, New York, with Dr. John Torrey. He also studied and did some teaching in the summer school of botany at Harvard College in 1875, 1876 and 1879, but his botanical career may be said to have begun in 1877 when he started a private class at Brown University. He writes later, "Botany was not taught at all in Brown till I myself introduced it in 1877." This was the first botanical class there, and it was a success. Bailey wrote later, "At the end of the season I was voted thirty dollars, and was tempted to go on by the title of instructor and the advanced pay of fifty dollars for the season of 1878." This was the beginning of a long course of botanical instruction, covering nearly thirty years, for he continued to teach there until his resignation in 1906. He became Professor of Botany in 1881. His college conferred upon him the degree of Ph.B. in 1873

and of A. M. in 1893. In 1900 he received the degree of LL. D. from the University of New Brunswick.

Professor Bailey devoted the best part of his life to botanical work in Brown University. During this period he confined himself to teaching and did not undertake any original scientific work. Vegetable morphology and systematic botany were the subjects to which he devoted himself mainly, and students who have since risen to an honorable position in the botanical world were among his pupils. He also conducted classes outside of his college work, lectured frequently in Providence and elsewhere and contributed articles, botanical and otherwise, to many papers, notably The American Naturalist, Botanical Gazette, Bulletin of the Torrey Botanical Club, New England Journal of Education, Providence Journal, etc. Between 1881 and 1899 Professor Bailey published 'Botanical Collectors' Hand-book' (1881), 'Botanical Note-book' (1894–1897), 'Among Rhode Island Wild Flowers' (1895 and 1896), 'New England Wild Flowers' (1895), and 'Botanizing' (1899). His early experiences at West Point are vividly told in a brochure entitled 'My Boyhood at West Point,' published in 1891, and in a series of seventeen newspaper articles entitled 'Recollections of West Point,' published in 1900, by 'The News of the Highlands,' a local paper of the West Point region.

By nature Bailey had a fine artistic temperament, and the productions from his pen, pencil and brush were always the delight of his friends. Beautiful colored drawings, illustrating plant structure, insect pollination and the like, were used in his class work and his lectures. His poetic nature is shown in the many verses that he wrote both for publication and for his friends, and in 1909 he published a collection of the principal ones. He made staunch friends, and was an unremitting and brilliant correspondent, his letters teeming with wit and showing his wide knowledge of books. At class and society reunions Bailey was always expected to make a speech or read a poem, and these were full of pathos or wit as the occasion required. Yet through all this busy life he was a constant sufferer from spinal and other troubles, and the wonder is that he was enabled to carry on his work as he did.

He was ever fond of visiting West Point and many were the weeks that he spent there or in the immediate vicinity. He kept up his friendship with his early comrades and he wrote later, "My best friend, the only one admitted to my youthful *penetralia*, was Robert

E. Lee, Jr., son of the famous Confederate general, who, from 1852 to 1855, was superintendent on the Post." He had many warm friends among the members of the New England Botanical Club of which he was a non-resident member, and he attended a number of its meetings in the earlier years of its life before his physical troubles increased.

In 1906 Bailey's failing health compelled his resignation from his college work. He was honored with the title of Professor Emeritus, and during the remainder of his life he lived quietly at home, devoting much of his time to reading and writing. But his ever increasing physical troubles wore heavily upon him and at last, on February 20, 1914, he died. The funeral was held at the family home in Providence on February 23. At his own request his coffin was draped with the American flag, and the authorities at West Point allowed his body to be laid to rest in the Academy grounds near that of his father.

On March 14, 1881, Professor Bailey was married to Eliza Randall Simmons of Providence. She and two children, Whitman and Margaret Emerson, survive him.

Cambridge, Massachusetts.

OPUNTIA VULGARIS ON CAPE COD.

F. S. Collins.

The occurrence of *Opuntia vulgaris* Mill. at Nantucket has long been a matter of record; it is common there on the peninsula of Coatue. The earliest record appears to be by Hitchcock in 1833.[1] "Cactus Opuntia, Nantucket, T. A. Green. *Prickly Pear.*" It does not appear in the first and second editions of Bigelow's Florula, but is mentioned in the third edition.[2] "Found at Nantucket, June, July."

In the first edition of Gray's Manual, 1848, p. 141, the distribution is given as "Sandy fields and dry rocks, Nantucket to N. J. and southward near the coast." Later editions have practically the same. In

[1] Edward Hitchcock, Report on the Geology, Mineralogy, Botany and Zoology of Massachusetts, p. 605.

[2] Jacob Bigelow, Florula Bostoniensis, third ed., 1840, p. 203.

the various editions of Britton's Manual and Britton and Brown's Flora, the range is given as "Eastern Mass. to Penn. & Fla." From a purely geographical point of view, "Eastern Mass." is correct for Nantucket, though possibly misleading as implying a wider range. I have been unable, however, to find any Massachusetts station recorded outside of Nantucket.

On October first, 1913, I was making my last collecting trip of the season, in Wellfleet, Massachusetts, and I came upon a large colony of the *Opuntia*, thoroughly established. It was about a mile from the settled part of the town, and grew on both sides of the road for two hundred feet or more, extending back into the fields. The plants were nearly prostrate, merely projecting slightly; the flowering season was past, but there was abundance of the fruit, sometimes as many as five fruits on a single segment. It appeared to occupy the ground so thoroughly that no other vegetation but a scanty growth of grass was found among it. The fruit, though well formed and containing hard seeds, was only about half the size of what I had seen on plants of the same species in Bermuda, two months before.

There was a "No Trespass" sign near by; usually a botanist pays no attention to such signs, but in this case it had some interest, as it gave the name of the owner of the property, George W. Lawrence, and I wrote to Mr. Lawrence, asking for information in regard to the plant. He very kindly replied as follows: — "I have consulted an old lady (87 years of age) who used to live in the old Hickman house, as we call it, when she was a girl, and she says, the prickly pear cactus was there at that time; she does not know where it might have come from. I have owned the place since Nov. 1908, and the man I bought it of has just died. The 'No Trespass' sign was to keep the boys away from the fruit. An old gentleman (79) a native, says it was there when he was a small boy. The old Hickman family used to have beautiful flowers, so my wife says, and she used to visit at the old house when she was very young. Probably the plant was brought there sometime, as it is not found anywhere else in town." [1]

I referred to my discovery at a meeting of the New England Botanical Club, in the hope of hearing of other stations, and was again fortunate, for Mr. C. F. Batchelder remembered having seen it, and at my request he notes the following particulars: — "In September, 1876, I

[1] Later Mr. Lawrence wrote me "Mr. Nye, our postmaster, tells me there is another little patch of the 'cactus' up by Higgins Pond, about two miles from my place."

found a small *Opuntia* (doubtless *O. vulgaris*) growing at the head of a sand beach near Osterville, in the township of Barnstable, on the south side of Cape Cod. According to my recollection, there was no single large colony, but small plants grew scatteringly along the beach; whether or not it was widely distributed along the coast, I cannot say."

With a view of ascertaining whether the plant persisted, I wrote to Mrs. Margaret M. Theodore of Centreville, who is familiar with the flora of that region, and she writes, "I have looked through Mrs. Cheney's 'Plants from Cape Cod' hoping to be able to locate your Prickly Pear exactly in it, as she made exhaustive examinations of this region, but do not find it in the list. Then comes my young naturalist, my boy John, to the rescue.—'Sure I know where to find it. There's two or three lots of it around here,' and he describes it accurately." Osterville and Centerville are settlements in the town of Barnstable, about a mile apart.

Mr. W. P. Rich tells me that it grows in Truro, on the grounds of Mr. Solomon Ryder, who has lived there for over 40 years, and who reports that it was there when he came. It now extends from the house over the lawn, into fields and under trees in every direction. In 1911 Mr. Rich transplanted a number of these plants from Mr. Ryder's place to a barren "sand lot" near the shore by his summer home at Truro; they thrived and are spreading, and flowered freely in 1912 and 1913.

The Truro station is the northernmost; from there to Wellfleet is five miles, from Wellfleet to Barnstable 25 miles. It seems now safe to consider *Opuntia vulgaris* as fairly established on the Cape; as to whether it is native may not be as clear. Mr. Rich is of the opinion that the plant was introduced at the Ryder station; the Lawrence station at Wellfleet, though it has a record of at least 75 years, appears to have an old farm house as its center of distribution. The Barnstable localities more resemble the Coatue station at Nantucket, which has always been considered as free from suspicion of human agency. It is not uncommon in gardens at Nantucket, transplanted from Coatue, and it may well be that old time captains from Truro and Wellfleet brought it to their gardens in the same way. Its present distribution seems to be much the same as that of other species which inhabit the coastal plain. It is common along the coast of New Jersey; five stations are recorded for Long Island, New York.[1] In Connecti-

[1] Smith Ely Jelliffe, The Flora of Long Island, 1899, p. 118.

cut the record is[1] "Exposed rocks and sandy soils, occasional along the coast, rare inland." Possibly other stations similar to those in Barnstable may be discovered, now that there is reason to look for them; in any case, it is now a part of the Cape flora.

We are accustomed to think of *Opuntia* as a subtropical genus, but while looking up references for this note I came across some information quite to the contrary as regards some species; it may be new to others, as it was to me. In the copy of the first edition of the Manual, at the Gray Herbarium, is a note against *Opuntia vulgaris*, in Dr. Gray's handwriting, "Grows N. on rocks to lat 50°. Dr. Richardson." The Richardson seems to be Sir John Richardson,[2] who says, "Cacti are numerous on the eastern side of the mountains in the same parallel; and the smaller kinds, chiefly *Opuntiae*, range northwards over prairies to the 49th parallel, and perhaps further north. We gathered *Opuntia glomerata* or the *Crapaud vert* of the voyagers, on the Lake of the Woods." A still more northern range is shown by Macoun[3] "*O. Missouriensis* DC., Prickly Pear. We refer all our eastern forms to this species, but without being certain, as specimens have seldom been preserved. The Qu'Appelle valley, about two miles from its mouth, and the north bank of the Assiniboine, above Shell River, are the most eastern localities known. It is found at Moose Jaw Creek and at the elbow of the South Saskatchewan, and thence south and west to Long. 112° at the Hand Hills. A species which I believe to be the same, reappears again at the north bank of Peace River, Lat. 56° 12′, where it grows on the arid clay slope, exposed often to a temperature of 55° below zero."

North Eastham, Massachusetts.

[1] Catalogue of the Flowering Plants and Ferns of Connecticut, 1910, p. 289.
[2] Arctic Searching Expedition, New York, 1852, p. 418.
[3] John Macoun, Catalogue of Canadian Plants, Vol. I, 1883, p. 177.

THE DISCOVERY OF THE LONG-SOUGHT ALGA, STICTYOSIPHON TORTILIS.

R. E. Schuh.

In his treatise on the Marine Algae of New England (Rept. of the U. S. Commission of Fish and Fisheries for 1879) Dr. Farlow expressed surprise that *Phloeospora* (*Stictyosiphon*) *tortilis* (Rupr.) Aresch. had not yet been found along our coast. It is frequent along the British coast, in the Baltic Sea and Arctic Ocean, along Spitzbergen and Greenland, and even in Bering Strait and the Okhotsk Sea. It is now my pleasure to report undoubted specimens of this widely distributed form from our northeastern coast. It is the habit of the plant to break up, thus reproducing vegetatively; and so it happens that, for many years, only occasional bits and imperfect specimens had been found both in Massachusetts and Rhode Island waters. Indeed, one from the latter state received the critical approval of Mr. Frank S. Collins, who has also very kindly examined the specimens referred to in this note.

Recently, while sorting some material from Vineyard Sound, collected October 12th, 1895, I found splendidly fruited specimens with the basal rhizoids still intact. They grew in company with *Ectocarpus siliculosus* and *Desmotrichum*, and apparently had been attached to decayed bits of *Chorda*. A slide is deposited in the herbarium of the New England Botanical Club. Illustrations may be found in various standard foreign works on brown algae.

Washington, D. C.

REPORTS ON THE FLORA OF THE BOSTON DISTRICT,—XIX.

SALICACEAE.

POPULUS.

P. alba L. Roadsides and waste land; escaping freely wherever planted, especially along the coast.

[*P. balsamifera* L. Cultivated (?), Danvers (*C. E. Faxon*, May 19, 1884).]

P. candicans Ait. Escaping occasionally, wherever planted.

P. deltoides Marsh. Introduced from further west; spontaneous at Lowell, Cambridge and Walpole, perhaps elsewhere.

P. grandidentata Michx. Woods and roadsides, common throughout.

P. nigra L., var. italica Du Roi. Occasionally persistent around old places, sometimes escaping.

P. tremuloides Michx. Woods and roadsides, very common throughout.

SALIX.

S. alba L. Introduced and escaping at several stations.

S. alba L., var. caerulea (Sm.) Koch. Sparingly escaped in Middlesex Fells, Boston and Wellesley.

S. alba L., var. vitellina (L.) Koch. Often planted, and thoroughly established, spreading in moist soil; pistillate trees very rare.

S. aurita L. Waste ground off Ipswich St., Back Bay, Boston (*F. F. Forbes*, 1905). Native of Europe and northern Asia.

S. babylonica L. Waste places, sparingly escaped around Boston.

S. candida Flügge. Abundant in a swamp near Crooked Pond, Boxford. First found by J. Robinson in 1875. One of several rare plants growing in this isolated limestone area.

S. cordata Muhl. Thickets and swamps, common throughout.

S. cordata Muhl., var. **angustata** (Pursh) Anders. Ice railway, Cambridge (*Wm. Boott*, May 18 and June 13, 1854); wet bank, W. Cambridge (*M. L. Fernald*, no date).

S. cordata Muhl., var. **myricoides** (Muhl.) Carey. Wet ground, Blue Hills, W. Quincy (*J. R. Churchill*, Apr. 25 and June 21, 1891); Milton (*J. R. Churchill*, April, May and June, 1891).

S. discolor Muhl. Swamps and roadside thickets, generally distributed throughout.

S. discolor Muhl., var. **eriocephala** (Michx.) Anders. Waltham (Gray Herb., no date); Roxbury (*J. A. Lowell*, 1849); Framingham (*E. C. Smith*, May 9, 1899).

S. discolor Muhl., var. **prinoides** (Pursh) Anders. Cordaville Road, Framingham (*E. C. Smith*, May 15, 1899); swamp, Blue Hills, W. Quincy (*J. R. Churchill*, Apr. 25, May 10 and June 21, 1891).

S. FRAGILIS L. Recorded as introduced at several stations, but apparently not evenly distributed.

S. humilis Marsh. Sand-plains and dry soil; common, especially southward.

S. lucida Muhl. Swamps and wet places; frequent, especially northward.

S. nigra Marsh. Shores of streams and ponds, frequent.

S. nigra Marsh., var. **falcata** (Pursh) Torr. Occasional.

S. NIGRICANS Sm. Waste ground off Ipswich St., Back Bay, Boston (*F. F. Forbes*, 1907). Native of Europe and northern Asia.

S. pedicellaris Pursh, var. **hypoglauca** Fernald. Peatbogs and swamps in central and northern portions; frequent. First published in RHODORA xi. 161, 1909.

Salix pedicellaris Pursh, var. **tenuescens** Fernald. Meadows of Concord River, Bedford (*M. L. Fernald*, May 23, 1909). Type station. Published in RHODORA xi. 162, 1909.

S. PENTANDRA L. Pond shores and roadsides; Wayland, Weston, Wellesley, Brookline.

S. petiolaris Sm. Swamps and wet places, frequent.

S. PURPUREA L. Wet places, occasional.

S. rostrata Richards. Swamps and thickets, common.

S. sericea Marsh. Swamps, frequent.

S. subsericea (Anders.) Schneider. (See RHODORA xi. 9–12, 1909.) Low grounds; Arlington, Cambridge, Brookline, Dedham, Wayland, Sudbury.

S. tristis Ait. Sand-plains and dry places, common throughout.

S. VIMINALIS L. Introduced and established at Medford, Cambridge, Roxbury, Brookline, Dorchester. See Robinson, Fl. Essex Co., 99, 1880.

HYBRIDS.

S. alba L. × fragilis L. A large staminate tree, persisting since before 1859, Cambridge (*W. Deane*); pistillate tree, Cambridge (*L. H. Bailey,* May, 1883); a large staminate tree, Dorchester (*J. R. Churchill,* 1887–8).

S. cinerea L. × **cordata** Muhl. Waste ground, Back Bay, Boston (*F. F. Forbes,* 1907).

S. cordata Muhl. × **lucida** Muhl. Knoll by Brookline waterworks land, Dedham (*F. F. Forbes,* 1908).

S. cordata Muhl. × **pedicellaris** Pursh., var. **hypoglauca** Fernald. Wet soil; Concord, Wayland, W. Roxbury, Dedham.

S. cordata Muhl. × **petiolaris** Sm. Swamps; North Andover, Cambridge, Boston, Brookline, W. Roxbury, Dedham, W. Quincy, Sherborn.

S. cordata Muhl. × **rostrata** Richards. Reservoir lot, Brookline (*F. F. Forbes,* 1909); border of swamp, Charles River meadow, Dedham (*F. F. Forbes,* 1908).

S. cordata Muhl. × **sericea** Marsh. Cambridge, W. Roxbury, Milton, W. Quincy, Sharon, Sherborn.

S. cordata Muhl. × **subsericea** (Anders.) Schneider. Cambridge (*L. H. Bailey,* 1884); border of swamp, Cow Island, W. Roxbury (*F. F. Forbes,* 1907 et seq.).

S. discolor Muhl. × **humilis** Marsh. Brookline, W. Roxbury, Wellesley, Natick; Middlesex Fells, according to Deane, Fl. Metrop. Park Res., 76, 1896.

[Mr. F. F. Forbes has found in moist land at W. Roxbury a specimen which he pronounces the above hybrid re-crossed with *S. discolor,* also a specimen re-crossed with *S. humilis.*]

S. discolor Muhl. × **rostrata** Richards. Wet ground near Hammond's Pond, Newton (*F. F. Forbes,* May 12 and Aug. 18, 1908); W. Roxbury (*F. F. Forbes,* May 10 and Aug. 10, 1908).

S. humilis Marsh. × **petiolaris** Sm. Roadside, Boxford (*F. F. Forbes,* May 30, 1909).

S. humilis Marsh. × **rostrata** Richards. Dry ground, Natick (*F. F. Forbes,* 1908).

S. humilis Marsh. × **sericea** Marsh. Dry soil, Natick (*F. F. Forbes,* 1908).

S. humilis Marsh. × **tristis** Ait. Dry sandy soil, Natick (*F. F. Forbes,* 1908).

S. petiolaris Sm. × **rostrata** Richards. Swamp, Cow Island, W. Roxbury (*F. F. Forbes,* 1908).

S. petiolaris Sm. × **sericea** Marsh. Swamp, Wayland (*F. F. Forbes,* 1912); wet ground, Sherborn (*F. F. Forbes,* May 21, 1907).

S. petiolaris Sm. × **subsericea** (Anders.) Schneider. Cow Island, W. Roxbury (*F. F. Forbes,* 1909).

S. petiolaris Sm. × **tristis** Ait. Dry sandy soil, Natick (*F. F. Forbes,* 1907).

The older specimens listed above have all been passed upon by the late M. S. Bebb, our best American student of *Salix*. The hybrids found by Mr. Forbes have in most cases been transplanted by him to his willow garden, where they are still under his observation and may be seen by others.

MYRICACEAE.

MYRICA.

M. asplenifolia L. Dry barren soil, very common throughout.

M. carolinensis Mill. Dry sandy soil; very common along the coast, becoming less abundant inland.

M. Gale L. Swamps, frequent throughout.

JUGLANDACEAE.

CARYA.

C. alba (L.) K. Koch (not *C. alba* Nutt.). Dry open woods; common in southern and central portions; reported as far north as Danvers and Essex.

C. cordiformis (Wang.) K. Koch. Dry soil, well distributed except in west and northwest, but seldom abundant.

C. glabra (Mill.) Spach. Dry rocky soil; common.

C. microcarpa Nutt. (in part). Waverley, Belmont (*B. L. Robinson,* June 2, 1895); Dorchester (*W. Deane,* Sept. 21, 1887). Mr. C. E. Faxon writes that there are specimens at the Arnold Arboretum, collected by himself, from Reading, Wellesley Hills, Lexing-

ton and Jamaica Plain. He says, "It is the common round pignut with sweet meat and grows everywhere around Boston, as I understand it."

In Trees and Shrubs by C. S. Sargent, Vol. II, Part IV, page 208, August, 1913, is the following note, "Carya ovalis, var. obcordata, *n. var.* .... *Carya microcarpa*, Nuttall, *Gen.* ii. 221 (in part) (1818). .... This is the most widely and probably the most generally distributed variety. It is common in southern New England .... The fruit varies from subglobose to short oblong or to slightly obovate .... The nut is usually much compressed, often broadest above the middle, slightly angled sometimes to below the middle, rounded at the base and rounded and often more or less obcordate at the apex."

C. ovata (Mill.) K. Koch (*C. alba* Nutt). Dry open woods, common throughout.

In the paper cited above, on page 207, Prof. Sargent publishes the following variety, "Carya ovata, var. Nuttallii, n. var. *Carya microcarpa*, Nuttall, *Silva N. Am.* i. 39, t. 13 (not *Carya microcarpa*, Nuttall, *Gen.* ii. 221) (1842)....

"The nut of this variety is rounded, obcordate or rarely pointed at the apex, rounded or abruptly pointed at the base, much compressed, prominently angled.... Except in the size of the fruit there appear to be no characters by which this variety can be distinguished from the common Shagbark. I have seen specimens of the variety from eastern Massachusetts ...."

Swampscott (*J. G. Jack*, September, 1894).

JUGLANS.

J. cinerea L. Roadsides and open woods; common in north and central sections, but not reported from extreme south.

BETULACEAE.

ALNUS.

A. incana (L.) Moench. Borders of streams and swamps; Sharon, Canton and Hingham northward.

A. rugosa Du Roi. Swamps and borders of streams; very common southward, less common northward.

A. VULGARIS Hill. Swamps and moist soil, at W. Medford and Waltham; edge of saltmarsh at Brookline and Hingham.

BETULA.

B. alba L., var. **papyrifera** (Marsh.) Spach. Dry woods, scattered trees as far south as Sharon, Hingham and Scituate.

B. lenta L. Rich woods, frequent except in southeastern portion, where it has not been reported.

B. lutea Michx. f. Rich moist woods; occasional in Essex and Middlesex counties, with scattered trees as far south as Canton and Scituate.

B. nigra L. Moist banks of Merrimac River and lower portions of its tributaries from Amesbury west to Tyngsboro and Dracut and across the state-line to Pelham, N. H.; also near Parker River in Georgetown and Byfield [Newbury], and at Ipswich. A few trees in a dry pasture at Groton (C. H. Knowlton, RHODORA xiv. 235, 1912) are probably introduced. There are no other stations for this species nearer than Suffolk Co., Long Island, 115 miles to the southwest.

B. populifolia Marsh. Dry sandy soil, abundant everywhere.

CARPINUS.

C. caroliniana Walt. Wet soil and borders of streams in central and northern portions; not reported from southern third of district.

CORYLUS.

C. americana Walt. Dry soil; common throughout.

C. rostrata Ait. Generally distributed in dry soil, but not abundant.

OSTRYA.

O. virginiana (Mill.) K. Koch. Dry rocky woods, frequent.

FAGACEAE.

CASTANEA.

C. dentata (Marsh.) Borkh. Woods and pastures; abundant in many places in western and central portions, much less common near the coast and to the southward.

C. pumila (L.) Mill. Two clumps in a dry thicket, Stony Brook Reservation, W. Roxbury. See E. F. Williams, in Rhodora xiii. 90, 1911. The only New England station.

FAGUS.

F. grandifolia Ehrh. Rich woods, occasional throughout. There are considerable areas covered densely with it on Cape Ann and at Beechwood, Cohasset, but trees are usually scattering.

F. grandifolia Ehrh., forma **pubescens** Fernald & Rehder. South Braintree (*A. Rehder*, May 30, 1907). See Rhodora ix. 111-112, 1907.

QUERCUS.

Q. alba L. Dry woods; one of our commonest trees. The largest and best preserved specimens are in Beaver Brook Reservation, Waverley. See Deane, Fl. Metrop. Park Res. 73, 1896.

Q. bicolor Willd. Swamps and low ground; common throughout. One very large tree at Waverley. See Deane, Fl. Metrop. Park Res. 74, 1896.

Q. coccinea Muench. Dry soil; frequent throughout.

Q. ilicifolia Wang. Dry barren soil; very common throughout.

Q. imbricaria Michx. A single tree 4 feet 3 inches in girth at 3 feet up; two feet inside the wall of an old pasture, Brush Hill Road, Milton (*G. G. Kennedy*, Oct. 21, 1900; May 16 and May 22, 1902). See Rhodora xiv. 34, 1912.

[*Q. palustris* Muench. Large tree on Beane estate, Ipswich, in field on the back street (*J. Robinson*, Oct. 13, 1891). Spec. in herb. Peabody Acad. Sci. Probably set out, as elsewhere in district.]

Q. prinoides Willd. Dry soil, frequent throughout.

Q. Prinus L. Rich woods; local in Essex and Middlesex counties and in the Blue Hill region.

Q. Robur L. Roadside near Sunset Rock, Andover (*A. S. Pease*, Sept. 21, 1903); W. Medford (*C. H. Morss*, October, 1898); thoroughly established and spreading in dry woods, Duxbury (*C. H. Knowlton*, Sept. 24, 1911. See Rhodora xiv. 20, 90, 1912); Salem, according to Robinson, Fl. Essex Co. 97, 1880.

Q. rubra L. Woods, rather common.

Q. velutina Lam. Dry woods, common throughout.

HYBRIDS.

Q. alba L. × **bicolor** Willd. A natural tree growing in Franklin Park, Roxbury (*J. G. Jack,* 1895–1904).

Q. alba L. × **Prinus** L. A non-fruiting tree grows in Concord on the estate of Wm. Brewster, in the edge of woods by a wet run. This tree Mr. A. Rehder tentatively pronounces to be the above hybrid, but fruit is needed for absolute determination.

Q. ilicifolia Wang. × **velutina** Lam. Top of Blue Hill (*A. Rehder,* September, 1900). See Rhodora iii. 137, 1901.

C. H. Knowlton } *Committee on*
Walter Deane } *Local Flora.*

THE ORIGINAL FLORA OF THE OLD COLONY.

Clarence H. Knowlton.

Thoreau's frequent quotations in "Cape Cod," have led me to the book called "Mourt's Relation," a diary of early events in Plymouth colony, probably written by William Bradford and Edward Winslow. The floral notes seem to me more likely from Winslow's pen, for Bradford's own history scarcely mentions a plant, while Winslow on his trip to see Massasoit, and in a letter home to England, writes rather fully of what grew in the new country. The book is well worth reading, for about it still lingers "the charm of Sixteenth Century prose," and the events of the early years at Plymouth are exceedingly interesting. It was published in London in 1622, and there have been several reprints. It has seemed worth while to me to collate the notes on the flora of southeastern Massachusetts for the benefit of Rhodora readers.

"Upon the 9th of November following, by break of the day, we espied land, which we deemed to be Cape Cod, and so afterward it proved. And the appearance of it much comforted us, especially seeing so goodly a land and wooded to the brink of the sea. . . . And upon the 11th of November we came to an anchor in the bay [Province-

town harbor], which is a good harbour and pleasant bay, circled round, except in the entrance, which is about four miles over from land to land, compassed about to the very sea with oaks, pines, juniper, sassafras, and other sweet wood. . . . . The same day, so soon as we could, we set ashore fifteen or sixteen men, well armed, with some to fetch wood, for we had none left, as also to see what the land was. . . . . They found it to be a small neck of land [Long Point]; on this side where we lay, is the bay, and the further side the sea; the ground or earth sand hills, much like the downs in Holland, but much better; the crust of the earth, a spit's depth, excellent black earth; all wooded with oaks, pines, sassafras, juniper, birch, holly, vines, some ash, walnut; the wood for the most part open and without underwood, fit either to go or ride in. At night our people returned, but found not any person, nor habitation; and laded their boat with juniper, which smelled very sweet and strong, and of which we burnt the most part of the time we lay there."

On the 15th another party was set ashore and proceeded about ten miles. The next morning, in Truro, "we marched through boughs and bushes, and under hills and valleys, which tore our very armor in pieces. . . . . About ten o'clock we came into a deep valley, full of brush, wood-gaile and long grass. . . . . And as we went in another valley, we found a fine clear pond of fresh water, being about a musket shot broad, and twice as long. There grew also many small vines, and fowl and deer haunted there. There grew much sassafras. . . . . We went on further and found new stubble, of which they had gotten corn this year, and many walnut trees full of nuts, and great store of strawberries, and some vines." Further on they came to some deserted Indian houses, in which they found "two or three baskets full of parched acorns. . . . We found also a little silk grass, and a little tobacco seed, with some other seeds which we knew not. Without was sundry bundles of flags, and sedge, bulrushes, and other stuff to make mats."

There are no further botanical notes until Plymouth harbor was reached, on Dec. 16. "This harbour is a bay greater than Cape Cod, compassed with a goodly land; and in the bay two fine islands, uninhabited, wherein are nothing but woods, oaks, pines, walnuts, beech, sassafras, vines and other trees which we know not. . . . . Monday, the 18th day, we made a land, manned with the master of the ship and three or four of the sailors. We marched along the coast

in the woods some seven or eight miles.... The land for the crust of the earth is a spit's depth, excellent black mould, and fat in some places; two or three great oaks, but not very thick, pines, walnuts, beech, ash, birch, hazel, holly, asp, sassafras in abundance, and vines everywhere, cherry trees, plum trees, and many others which we know not. Many kinds of herbs we found here in winter, as strawberry leaves innumerable, sorrel, yarrow, carvel, brooklime, liverwort, water-cresses, great store of leeks and onions, and an excellent strong kind of hemp."

A year later Edward Winslow, writing enthusiastically to a friend in England under date of Dec. 11, 1621, writes the following: "All the spring-time the earth sendeth forth naturally very good sallet herbs. Here are grapes, white and red, and very sweet and strong also; strawberries, gooseberries, raspas, etc.; plums of three sorts, white, black and red, being almost as good as a damson; abundance of roses, white, red and damask; single, but very sweet indeed."

In July, 1621, Edward Winslow and Stephen Hopkins set out to spend July 4th and 5th with their Indian friend, Massasoit, at Packanokick. They went through Namaschet [Middleboro] to the Taunton River, and down its shores. "As we passed along, we observed that there were few places by the river but had been inhabited; by reason whereof much ground was clear, save of weeds, which grew higher than our heads. There is much good timber, both oak, walnut tree, fir, beech, and exceeding great chestnut trees."

Other passages later on refer to "ground-nuts" as a source of food-supply for the Indians, and in times of shortage, for the colonists themselves.

I shall let each reader supply for himself the modern names for these pre-Linnaean plants, but it is of interest here to read Thoreau's remarks in Cape Cod, and an article by S. B. Parish in Rhodora III, 17, "The Vegetation of Plymouth Three Hundred Years Ago."

In Rhodora IV, 81, Mr. John Robinson has commented on some of these Plymouth plants. He also quotes from a correspondent who suggests that this list was copied from Francis Higginson [Higgeson] who published a similar list of plants of New England.

This cannot be so, however, for Mourt's Relation was written from day to day as the events took place, and was *printed* in its present form in 1622 several years before Higginson left England for this country. It is a pleasure to clear these old worthies of the alleged

plagiarism. There is no reason to suppose that the two lists were not prepared independently, and the Plymouth list must have been.

Hingham, Massachusetts.

The narrow-leaved Variety of Salix pyrifolia.— In one of his discussions of *Salix balsamifera* Barratt, the late M. S. Bebb set off some leaf-extremes as varieties (Bull. Torr. Bot. Cl. xv. 124). With the exception of one, his var. *lanceolata,* they have not seemed to the writer worthy separate designation; but the var. *lanceolata* is found in some of the swamps of eastern Newfoundland to be so uniform and to occur in such extensive areas that it seems well worth recognition. But, unfortunately, the highly appropriate and long-used name, *S. balsamifera* Barratt, was published as a specific name merely in synonymy and was not validated as a specific name until 1879, when Bebb brought it forward (Bot. Gaz. iv. 190). In the meantime *S. pyrifolia* Andersson was properly published (Vet. Acad. Handl. Stockh. vi. no. 1, 162) in 1867 and as the first valid specific name must stand. The narrow-leaved shrub should, therefore, be called

Salix pyrifolia Anderss., var. **lanceolata** (Bebb) n. comb. *S. balsamifera,* var. *lanceolata* Bebb, Bull. Torr. Bot. Cl. xv. t. 81, fig. 7 (1888).— M. L. Fernald, Gray Herbarium.

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THE EARLIEST NAME OF THE SNOWBERRY.

Sidney F. Blake.

For more than a century the ornamental shrub cultivated in gardens under the name of Snowberry has been almost universally known by the name *Symphoricarpos racemosus* given it by Michaux [1] in 1803. Nevertheless the species had been described by Linnaeus [2] half a century before in the first edition of the Species Plantarum as *Vaccinium album*, a name based solely on specimens collected by Kalm in Pennsylvania and preserved in the Linnaean Herbarium and in the British Museum. The specific name and character remained unchanged through the various editions of the Species Plantarum, and the Linnaean diagnosis is repeated without remark in the thirteenth, fourteenth, and fifteenth editions of the Systema. Meanwhile Lamarck [3] in 1783 took up the name for the plant now known as *Vaccinium canadense* Richardson,[4] of which he was the first to publish a description. Pursh [5] described under the same name a form of *Vaccinium stamineum* L., and was followed in this error by Sprengel [6] in the sixteenth edition of the Systema. Then in 1834 G. Don,[7] ap-

[1] Mx. Fl. Bor.-Am. i. 107 (1803). [2] L. Sp. Pl. i. 350 (1753).

[3] Lam. Ency. i. 73 (1783).

[4] Commonly accredited to "Kalm ex Richardson," but the original description, as well as the type specimens in the British Museum, clearly shows that Kalm had nothing to do with the name. *V. vacillans* "Kalm ex Torr." is in somewhat similar case; as shown by Britten (Journ. Bot. xlii. 55 (1905)), Kalm, although quoted as its author by Torrey in the original publication, had no connection whatever with the name, Solander, who was not mentioned by Torrey and so cannot be quoted as author of the species, having been the real name of the plant, which should be called *V. vacillans* ["vaccillans"] Torr.

[5] Pursh, Fl. Am. Sept. i. 162 (1814). [6] Spreng. Sys. ed. 16. ii. 210 (1825).

[7] G. Don, Gen. Hist. iii. 448, 853 (1834).

parently influenced by a note of Smith's on the sheet in the Linnaean Herbarium, identified the name with Pursh's[1] *Xylosteum ciliatum β. album*, described as new from specimens collected "on the Rocky-mountain" by Lewis, which according to Nuttall[2] is "*Symphoria racemosa* of Michaux,[3] now cultivated in several gardens near Philadelphia from seeds collected by the late governor Lewis." Later authors, such as Gray,[4] Britton and Brown,[5] and the Index Kewensis, have been content to refer the Linnaean *Vaccinium album* to *Lonicera ciliata* Muhl. (= *L. canadensis* Marsh.) itself, and the combination *Lonicera alba* (not of L. Sp. Pl., which is *Chiococca alba* (L.) Hitchc.) has recently been made on purely synonymic grounds by Druce,[6] without reference to the easily accessible Linnaean type.

The type specimen in the Linnaean Herbarium represents the typical form of *Symphoricarpos racemosus* Mx., which, as shown by Fernald[7] some years ago, is not the ordinary glabrous-leaved garden plant as had long been supposed, but the more common eastern form with leaves densely pilose, and somewhat paler but not whitened, on the under surface. On the sheet is written in Linnaeus' hand "4 album K"; in pencil in an early hand (not known to Mr. B. D. Jackson, who kindly examined it) is the note "baccis albis," from which Linnaeus evidently drew his specific name; J. E. Smith has signified his opinion that the plant is a *Lonicera;* and Gray has marked it *Symphoricarpos racemosus,* although he never published this determination, but still referred it to *Lonicera ciliata* when last writing on it in 1878. The Snowberry must accordingly drop the name it has borne so long and be called

Symphoricarpos **albus** (L.) Blake, n. comb. *Vaccinium album* L. l. c. (1753). *Symphoricarpos racemosus* Mx. l. c. (1803); Fernald, l. c. (1905). Lonicera racemosa (Mx.) Pers. Syn. i. 214 (1805). *Symphoria racemosa* (Mx.) Pursh, l. c. (1814). *Symphoria leucocarpa* Hort., *S. heterophylla* Presl, & *S. elongata* Presl, in DC. Prod. iv. 339 (1830), as syn. *Symphoria albus* Raf. New Fl. iii. 21 (1836). *Symphoricarpos albus* "Raf." K. Koch, Dendr. ii. pt. 2. 407 (index) (1873).

[1] Pursh, Fl. Am. Sept. i. 161 (1814).
[2] Nutt. Gen. i. 138 (1818).
[3] This was the form used by Pursh (Fl. i. 162), not Michaux.
[4] Gray, Syn. Fl. ii. pt. i. 201 (1878).
[5] Britton & Brown, Ill. Fl. iii. 241 (1898).
[6] Bot. Exch. Club Rept. 1913. iii. pt. 5. 420 (1914).
[7] Fernald, Rhodora vii. 164–167 (1905).

(*Symphoria albus* [*a*] Raf. l. c. is a nomen nudum, applied to the Snowberry quite without reference to *V. album* L., and *Symphoricarpos albus* Koch occurs only as a pure synonym of *S. racemosus*, so treated by Koch himself (and wrongly ascribed to Rafinesque), likewise having no connection with the name *Vaccinium album* L.). *Lonicera alba* (L.) Druce l. c. (1914), as to name only.

S. albus var. **pauciflorus** (Robbins) Blake, n. comb. *Symphoricarpus racemosus* var. *pauciflorus* Robbins in Gray, Man. ed. 5, 203 (1867), in part; emend. Fernald, l. c. *Symphoricarpos pauciflorus* (Robbins) Britton, Mem. Torr. Club. v. 305 (1894), in part.

S. albus var. **laevigatus** (Fernald) Blake, n. comb. *Symphoricarpos racemosus* var. *laevigatus* Fernald, l. c. 167 (1905). *S. racemosus* of most auth., not Mx.

London, England.

THE GENUS RUPPIA IN EASTERN NORTH AMERICA.

M. L. Fernald and K. M. Wiegand.

(Plate 110.)

During our field-work of 1911, a tiny *Ruppia* was collected in tidal pools at Norris Arm in eastern Newfoundland, which differed very strikingly from the ordinary plant which we had known as *R. maritima*. Later, after our return from Newfoundland, somewhat similar, but in some characters quite different, material, collected as an unusual plant by Dr. B. M. Duggar on Naushon Island, was referred to us for study; and in the explorations of Prince Edward Island and the Magdalen Islands by Messrs. Fernald, Long and St. John a special point was made of watching *Ruppia*, with the result that they got several extreme plants such as we rarely see on the Atlantic coast of the United States. Examination of these plants and the material in the Gray Herbarium, the herbarium of the Academy of Natural Sciences of Philadelphia, and the herbarium of the New England Botanical Club, in the light of the recent treatments of the genus in Europe shows that we have in America many more well defined forms of *Ruppia* than has been generally supposed and that, to a great extent,

our treatments of the group have depended more upon traditional interpretations than upon close study of the plants in the field.

In Europe, *Ruppia maritima* has long been considered the type of a somewhat complex group of species, subspecies and varieties. By many authors of the present day four species, *R. maritima* L. in the strict sense (*R. spiralis* Dumort.), *R. drepanensis* Tineo, *R. rostellata* Koch, and *R. brachypus* Gay, are recognized; while by others, Briquet, for instance, in his *Prodrome de la Flore Corse, R. maritima* is treated as the type of an aggregate species with well defined subspecies; and by Ascherson & Graebner, in Engler's *Pflanzenreich*, a somewhat similar course is followed, with a confusing division of subspecies, proles, and varieties.

In America the treatment has been more conservative, apparently too much so. Early writers, such as Michaux, noted some divergence in the American and European plants,[1] but all treated our eastern species as *Ruppia maritima;* and Nuttall in his description used a character which is by no means constant in American plants but is diagnostic of true *R. maritima* of Europe: "peduncle convolute-stretching or contracting according to the depth of water, after the manner of *Vallisneria*."[2] Gray stated, however, simply that "the spadix itself also [after flowering is] raised on an elongated thread-form peduncle,"[3] and in the description of the species in northeastern America said: "chiefly a narrowly leaved var. with strongly pointed fruit, approaching R. rostellàta, *Koch*." This statement stood in the Manual through five editions, but in the 6th edition, by Watson and Coulter, the reference to *R. rostellata* was dropped. In two recent American monographs of our *Najadaceae*, the spiraling peduncle again appears as a primary character. Thus in Morong's *Naiadaceae of North America*, under *R. maritima* we find: "In fruit the peduncles are greatly elongated, sometimes as much as 12 inches or even more ....The drupes vary a good deal in shape, usually simply conical with a short gibbous swelling at the base, sometimes with a strong spur-like projection and a curved outline, as in the form known in Europe as *R. rostellata*, Koch, which does not, however, differ otherwise from the type. Specimens with fruit of this shape are sent from

[1] "Obs. Mea cum Europæa omnino convenit; in eo tamen differens (si qua fides iconi optimi Gætneri) quod fructus ovoidens sit et in colliculum a stylo persistente desinat." — Michx. Fl. Bor.-Am. i. 102 (1803).

[2] Nutt. Gen. i. 111 (1818).

[3] Gray, Man. 454 (1848).

Oregon by Mr. Howell. Forms with fruit nearly destitute of peduncles and pedicels, and broad strongly marked sheaths, similar in these respects to *R. brachypus*, Gay, occur at Wood's Hole, Mass., and at other places along the Atlantic coast." [1] In the later monograph of the group, by Mr. Norman Taylor,[2] the American *R. maritima* is made to have "flowers on a short pedicel which elongates after anthesis, and is ultimately a loosely coiled spiral," the fruit is defined as "ovoid, equilateral, or gibbous and oblique,. . . style short and stout, or finely attenuate, straight or hooked; pedicels of the fruit 1.3–3 cm. long"; no mention being made either of *R. rostellata* or of the plant from Wood's Hole and "other places along the Atlantic coast" which Morong described as "nearly destitute of peduncles and pedicels."

These very diverse treatments of *Ruppia maritima* by different students in Europe and America have led the writers, as already stated, to study with some care the available American material in its relation to the European. The American plants fall readily into the two groups including *R. occidentalis* Watson on the one hand and on the other the mass of material which has passed as *R. maritima;* and in the present notes we will deal only with the latter plants and more especially with those which occur in the Northeast.

In the first place, we can find among eastern specimens none which agree with *Ruppia maritima* as interpreted by such English authors as Britten and Rendle or Druce; or with *R. maritima,* subsp. *spiralis* of Graebner and of Briquet. This plant, which Briquet speaks of as "R. maritima L., sensu stricto," has the peduncle after anthesis becoming very elongate and spirally twisted at base, and the ovoid slightly oblique gradually attenuate or bluntish fruiting carpels on podogynes 4–10 times as long. The only North American material which satisfies these requirements and matches closely the Old World specimens and plates in its long spiraling peduncles and subequilateral bluntish fruit is from the extreme West. Material from Clear Lake, California, collected by Dr. Ayres seems to us quite like the true *R. maritima* of Europe. On the Atlantic coast, however, from Newfoundland to South America and locally on the Pacific coast, there is a plant with long spiraling peduncles, as in the European *R. maritima,* but with the fruit very oblique or semilunate and prominently beaked as in the short-peduncled *R. rostellata* Koch (*R. maritima,* var. *rostrata*

[1] Morong, Mem. Torr. Bot. Cl. iii. no. 2, 55, 56 (1893).
[2] N. Taylor, N. A. Fl. xvii. 14 (1909).

Agardh). But with this characteristic fruit-form it cannot be satisfactorily placed with typical *R. maritima*, and with its long spiraling peduncle it is not referable to *R. maritima*, var. *rostrata* which it simulates in fruit. This long-peduncled plant is *R. maritima* var. *longipes* Hagström. Another common plant of North America, of possibly wider range than var. *longipes* is a very close match for the Old World material and plates of *R. maritima*, var. *rostrata* Agardh (*R. rostellata* Koch), having the semilunate strongly beaked fruit on long podogynes, but the peduncle only 1–3 cm. long and merely flexuous, not spiraling. This and the American plant with long spiraling peduncles (var. *longipes*) clearly intergrade; but so emphatic are the students of the group in Europe, that there *R. rostellata* never has elongate and spiraling peduncles, while the true *R. maritima* with subequilateral bluntish, not semilunate or eccentrically beaked, fruit always has such peduncles, that it seems right to follow Hagström in separating the var. *longipes*.

This plant, var. *longipes*, simulating as it does true *R. maritima* (or *spiralis*) in its habit, but var. *rostrata* (*R. rostellata*) in its fruit, shows a characteristic which seems to pervade the entire series: namely, a strong tendency for the various characters of fruit and length of peduncle and of podogyne to reassert themselves in new combinations. It is doubtless this fact which has led to the ultra-conservative treatment in America which has heretofore made little or no attempt to define the various combinations of characters; but it is certainly most unsatisfactory, when we find in some of the natural areas of our coast a plant with peduncles uniformly less than 5 mm. long and podogynes essentially wanting, to be forced, on referring to an American monograph, to crowd it into a species which is said to have the peduncle "a loosely coiled spiral."

Our study of *Ruppia maritima*, though by no means satisfactory to us, has shown that we have in North America several clearly definable variants or recombinations of the variable characters. Whether these or any of them should be regarded as species is a debatable question, but our present feeling is that they are best regarded as varieties. For the present we are so considering them and we offer the following synopsis, not with any assurance of its finality but with the hope that it will lead to the fuller and more critical observation and collection which the plants demand; and we are indebted to Mr. F. Schuyler Mathews for his assistance in preparing drawings to illustrate the plants discussed.

A. Carpels ovoid, slightly oblique but not strongly eccentric nor curved, bluntish or not tapering to a conspicuous beak.
Peduncles in maturity 1–3 dm. long, strongly spiraling toward the base: podogynes 0.7–3 cm. long . . . . 1. *R. maritima*
Peduncles in maturity less than 6 cm. long, rarely spiraling.
Peduncles 1.5–6 cm. long: podogynes 0.6–2.5 cm. long. 2. var. *obliqua*
Peduncles 2–10 mm. long: podogynes 1–6 mm. long.
Podogynes distinctly longer than the carpels. 3. var. *intermedia*
Podogynes shorter than or about equaling the mature carpels. 4. var. *brevirostris*

A. Carpels strongly eccentric and distinctly beaked, or semilunate or curved.
Mature carpels 2–3 mm. long, shorter than the mostly elongate podogynes.
Mature podogynes 1–6 cm. long.
Mature podogynes 3–6 cm. long: peduncles long and spiraling. 5. var. *curvicarpa*
Mature podogynes 1–3 (rarely 3.5) cm. long.
Peduncles in maturity 3–30 cm. long, spiraling or flexuous. 6. var. *longipes*
Peduncles in maturity 0.5–3 cm. long, not spiraling. 7. var. *rostrata*
Mature podogynes 2–6 mm. long.
Mature peduncles 3–7 cm. long . . . . 8. var. *onondagensis*
Mature peduncles 0.5–1.5 cm. long . . . . . . 9. var. *subcapitata*
Mature carpels 1.5 mm. long, exceeding the very short podogynes. 10. var. *exigua*

1. Ruppia maritima L. Sp. Pl. i. 127 (1753). *R. spiralis* Dumort. Fl. Belg. 164 (1827). *R. maritima*, var. *spiralis* Moris, Stirp. Sard. Elench. i. 43 (1827). *R. maritima*, subsp. *spiralis* Aschers. & Graebn. Syn. i. 356 (1897) and in Engler, Pflanzenr. iv. fam. 11, 142 (1907); Briquet, Prod. Fl. Corse, i. 56 " = *R. maritima* L., sensu stricto" (1910).— Common in Europe and in parts of Africa and Australasia, and said by Ascherson and Graebner to be "in Nord- und Südamerika verbreitet." We have seen American material which seems referable to true *R. maritima* only from California: Clear Lake, *Ayres*. Figs. 1 and 2.

2. Var. obliqua (Schur) Aschers. & Graebn. Syn. i. 357 (1897) and in Engler, l. c. 145 (1907). *R. obliqua* Schur ex Griseb. & Schenk, It. Hungar. in Wiegm. & Erisch. Arch. xviii, 355 (1852). *R. transsilvanica* Schur, Österr. bot. Zeitschr. x. 356 (1860).— Southeastern Europe. Authentic specimens fairly matched by material from the Magdalen Islands and Prince Edward Island. Magdalen Islands: brackish or saline pools in the salt marsh near East Cape, Coffin Island, *Fernald, Long & St. John*, no. 6795. Prince Edward Island: saline water of South Lake and adjacent pools, Bothwell, *Fernald, Long & St. John*, no. 6800. Figs. 3 and 4.— Rydberg's *R. pectinata*, Mem. N. Y. Bot. Gard. i. 18 (1900) from Yellowstone

Park may belong here: it is described as having "peduncles 3–5 cm. long,...not spirally curved;....fruit ovoid, 1.5 mm. long, with an almost sessile stigma." The two specimens in the Gray Herbarium marked by Rydberg "*R. pectinata*" fail to meet these requirements: one, from Clear Lake, California, has the peduncles very long and extremely spiraled and is referred by us to typical *R. maritima;* the other, from Seattle, Washington, has the peduncles 3–7 mm. long and is nearest var. *intermedia*.

Var. *obliqua* seems to stand to true *R. maritima* in much the same relation as does var. *rostrata* to var. *longipes*. The Magdalen Island material, as stated, is very well matched by authentic Transylvanian material; but the Prince Edward Island specimens show an approach to var. *rostrata*. In the Magdalen Islands var. *obliqua*, which is best distinguished from var. *rostrata* by its plumper shorter-beaked and scarcely lunate fruit, occupies some of the brackish pools on Coffin Island, while adjacent pools of the same depth and with no obvious difference in their conditions are filled by var. *brevirostris*. So far as yet known these saline pools of Coffin Island and some of the salt ponds of Prince Edward Island, are the only American localities for these two varieties of *Ruppia*; while neighboring sands and fresh-water pools have some other European species or varieties in different groups, which are known from no other American region.

3. Var. INTERMEDIA (Thedenius) Aschers. & Graebn. Syn. i. 358 (1897) and in Engler, l. c. (1907). *R. intermedia* Thedenius, Bot. Not. (1887) 83. *R. maritima*, subsp. *brachypus*, form, Schlegel in Hartm. Skand. Fl. ed. 12, 57 (1889).— European specimens referred here are fairly well matched by material from Washington and California. WASHINGTON: Seattle, *Piper*, no. 2863. CALIFORNIA: Panamint Valley, *Coville & Funston*, no. 683 (Phil. Acad.). FIGS. 5 and 6.

4. Var. BREVIROSTRIS Agardh in Physiogr. Sällsk. Årsbetr. 6 Maj (1823) 37. *R. maritima*, var. *recta* Moris, Stirp. Sard. Elench. i. 43 (1827). *R. brachypus* Gay in Coss. Notes quelq. pl. Crit. i. 10 (1848). *R. rostellata β brachypus* Marsson, Fl. Neuvorpomm. u. Rüg. 498 (1869). *R. maritima*, var. *brachypus* Schlegel in Hartm. Skand. Fl. ed. 12, 57 (1889). *R. maritima*, subsp. *rostellata*, C. *brevirostris* Aschers. & Graebn. Syn. i. 358 (1897). *R. maritima*, subsp. *rostellata*, proles *brevirostris* Aschers. & Graebn. in Engler, l. c. (1907). *R. maritima*, subsp. *brevirostris* Briq. Prod. Fl. Corse, i. 57 (1910).— Europe and northern Africa. Apparently rare in North America; known to us only from the MAGDALEN ISLANDS: brackish or saline pools in salt marsh near East Cape, Coffin Island, *Fernald, Long & St. John*, no. 6797. See note under var. *obliqua*. FIGS. 7 and 8.

5. Var. **curvicarpa** (A. Nelson), n. comb. *R. curvicarpa* A. Nelson, Bull. Torr. Bot. Cl. xxvi. 122 (1899). *R. maritima*, subsp. *spiralis*,

proles γ. *curvicarpa* Graebner in Engler. Pflanzenr. l. c. 144 (1907). Wyoming: Laramie Alkali Lakes, *Nelson*. Figs. 9 and 10.

6. Var. longipes Hagström, Botaniska Notiser (1911) 138.— There can be no doubt that, although using the name *R. maritima* in the sense of *R. rostellata* Koch (not of *R. spiralis* Dumort), Hagström had the plant which is common, especially in Atlantic waters, in North America. His description clearly indicates this: "The European forms of **R. maritima** usually have rather short peduncles. A form from *Asia* gathered by Ove Poulsen at Buchara, in a saline pond, in 1898 (12,183), however, has somewhat longer peduncles (3–6 cm. or more). We propose to name it **var. longipes.** In the United States of America this variety seems to be the commonest *Ruppia.* It appears in two forms: one with more prominent, thin beak, **forma aculeata** n. f., belonging chiefly, as I think, to the eastern States, and the other 'with an almost sessile stigma' (Rydberg, l. c.), spreading westward: **forma pectinata** (Rydb., as sp.)." Of forma *pectinata* we have little knowledge except the specimens referred to under *R. maritima*, var. *obliqua*. Our common plant with peduncles sometimes reaching a length of 3 dm. is Hagström's forma *aculeata.* The following from the numerous specimens may be cited. Newfoundland: Killigrew's, *Fernald & Wiegand*, no. 4496. Nova Scotia: Sable Island, *St. John.* Maine: Phippsburg, *Kate Furbish;* Wells Beach, *Parlin & Fernald.* Massachusetts: Secachacha Pond, Nantucket, *F. S. Collins.* New Jersey: Atlantic City, *J. Carson* (Phil. Acad.); Ventnor, *T. S. Giihens* (Phil. Acad.); Cold Spring, Cape May Co., and Lily Pond, Cape May Point, *S. S. Van Pelt* (Phil. Acad.). Delaware: Rehobeth and Collins Beach, *A. Commons* (Phil. Acad.). Maryland: Mouth of Bush River, *G. H. Shull;* Tolchester Beach, *C. S Williamson* (Phil. Acad.). Florida: Alligator Bay, Monroe Co., *A. A. Eaton*, no. 1371; Manatee, *Tracy*, no. 6804. Texas: *Berlandier*, no. 3221. California: Monterey, *G. P. Snell* (Phil. Acad.). Bermuda Islands: Shelly Bay, *F. S. Collins*, no. 320. Bahama Islands: Great Guana Cay, *Britton & Millspaugh*, no. 2899. Guadeloupe: *Père Duss*, no. 3935. Figs. 11 and 12.— Clearly an extreme of the series represented by var. *rostrata* (*R. rostellata* Koch), and without question passing to it in our waters.

7. Var. rostrata Agardh in Physiogr. Sällsk. Årsbetr. 6 Maj. (1823) 37. *R. maritima*, var. *minor* Mert. & Koch, Deutschl. Fl. i. 861 (1823). *R. rostellata* Koch in Reichenb. Pl. Crit. ii. 66, t. 174, fig. 306 (1824); Gray Man. 454 (1848); Morong, Mem. Torr. Bot. Cl. iii. no. 2, 56 (1893). *R. maritima*, subsp. *rostellata* Asch. & Graebn. Syn. i. 356 (1897) and in Engler, l. c. 144 (1907); Briquet, l. c. 56 (1910). *R. maritima* Schlegel in Hartm. Handb. Skand. Fl. ed. 12, 57 (1889); Hagström, Botaniska Notiser (1911) 137.— Widely dispersed in Eurasia and Africa and Southern and Eastern Asia; widely distributed in temperate and tropical waters of North and South America. The

following from a large series of North American specimens are characteristic. Quebec: York, Gaspé Co., *Collins, Fernald & Pease.* Prince Edward Island: Rocky Point, and Bunbury, *Fernald, Long & St. John,* nos. 6798 & 8316. New Brunswick: Bathurst, *S. F. Blake,* no. 5485. Maine: Perry, *Fernald,* no. 1627; Little Cranberry Island, *Redfield;* Brunswick, *Kate Furbish;* Wells Beach, *Parlin & Fernald.* Massachusetts: Revere, *W. P. Rich;* North Cohasset, *Miss K. Parsons;* Truro, *W. P. Rich;* Orleans, *J. Murdoch, Jr.* Rhode Island: Tiverton, *J. C. Phillips.* New Jersey: Anchoring Island, New Inlet, Ocean Co., *B. Long* (Phil. Acad.); Maryland: Chester River, Queen Anne Co., *E. G. Vanetta* (Phil. Acad.). Florida: *Rugel.* Wyoming: Salt Creek, *A. Nelson,* no. 2557. British Columbia: Victoria, Vancouver I., *J. Macoun,* no. 4505. Washington: Seattle, *E. C. Smith & C. V. Piper,* no. 763. California: Panamint Valley, *Coville & Funston,* no. 729. Mexico: Manzanillo, *E. Palmer,* no. 1042. Figs. 13 and 14.

8. Var. **onondagensis**, n. var., var. *rostratae* similis; pedunculis post anthesin 3–7 cm. longis; podogynis 2–6 mm. longis; carpellis maturitate 2–3 mm. longis ovoideo-semilunatis, basi gibbosis, apice valde et suboblique rostratis.

Similar to var. *rostrata:* peduncles after anthesis 3–7 cm. long: podogynes 2–6 mm. long: carpels in maturity 2–3 mm. long, ovoid-semilunate, gibbous at base, conspicuously and subobliquely beaked.— New York: Onondaga Lake, 1864, *J. A. Paine* (type in Gray Herb.); August 15, 1880, *W. R. Dudley.*— Of the twenty-two mature fruits examined twenty-one have characteristically short podogynes, only one having the podogyne elongated nearly to 1 cm. in length and thus approaching the less characteristic specimens of the coastal plant, var. *rostrata.* Figs. 15 and 16.

Var. *onondagensis,* though with the fruit of vars. *longipes* and *rostrata,* differs from both in its much shorter podogynes. From var. *rostrata* it is further distinguished by its longer peduncle, which, though flexuous, apparently does not spiral as in the long-peduncled var. *longipes.* From var. *subcapitata,* which is apparently frequent about the Gulf of St. Lawrence, it is at once distinguished by its long peduncle; but its podogynes and fruits so closely resemble those of the latter plant as to suggest that var. *onondagensis* is a derivative of the maritime var. *subcapitata* which has become slightly altered in its isolated inland habitat.

9. Var. **subcapitata**, n. var., var. *rostratae* similis; pedunculis post anthesin 0.4–1.5 cm. longis; podogynis 1–6 mm. longis; carpellis maturitate 2–3 mm. longis ovoideo-semilunatis, basi gibbosis, apice valde et suboblique rostratis.

Similar to var. *rostrata;* the peduncles after anthesis 0.4–1.5 cm.

long; the podogynes 1–6 mm. long: fruiting carpels 2–3 mm. long, ovoid-semilunate, gibbous at base, prominently and subobliquely beaked.— Brackish or salt water, Quebec to Massachusetts. QUEBEC: Seven Islands, Saguenay Co., August 14, 1907, *C. B. Robinson*, no. 916. PRINCE EDWARD ISLAND: pools in salt marshes, Tignish, August 6, 1912, Bunbury, August 28, 1912, *Fernald, Long & St. John*, nos. 6799 (transitional to var. *rostrata*), 6796. MASSACHUSETTS: Salem, *J. L. Russell;* Mystic River Marshes, August 21, 1881, *F. S. Collins;* Hadley Harbor, Naushon Island, July, 1911, *B. M. Duggar* (TYPE in Gray Herb.). FIGS. 17 and 18.

Var. *subcapitata* in its short peduncles and podogynes closely simulates var. *brevirostris* but in the form of its fruit is much nearer var. *rostrata*. Most of the material (all from Massachusetts) has the podogynes less than 3 mm. in length; but one of the Prince Edward Island collections (no. 6799 from Tignish) has them longer (up to 6 mm.) and more slender, thus simulating var. *intermedia*. Its prominently beaked and semilunate fruit places it close to var. *subcapitata* and without the support of a larger suite of specimens it cannot well be given varietal separation.

10. Var. **exigua**, n. var., humilis repens; pedunculis 2–4 mm. longis; podogynis 0.5 mm. longis; carpellis maturitate; 1.5 mm. longis semilunatis prope erostratis.

Dwarf, repent: peduncles 2–4 mm. long: podogynes 0.5 mm. long: carpels 1.5 mm. long in fruit, semilunate, almost beakless.— NEWFOUNDLAND: shallow tidal pools in salt marsh, Norris Arm, August 21, 1911, *Fernald & Wiegand*, no. 4497. FIGS. 19 and 20.

In its tiny almost sessile essentially beakless fruit var. *exigua* suggests the most dwarfed extremes of var. *brevirostris*, but by the outline of the fruit it is clearly more related to vars. *rostrata* and *subcapitata*.

EXPLANATION OF PLATE 110.

Fruiting peduncles × 1 and mature carpels × 4. Figs. 1 and 2. *Ruppia maritima*, after Reichenbach, Ic. Crit. ii. t. 174; figs. 3 and 4, var. *obliqua*, from a Transylvanian specimen, coll. *Janka;* figs. 5 and 6, var. *intermedia*, Seattle, Washington, *Piper*, no. 2863; figs. 7 and 8, var. *brevirostris*, Coffin Island, Magdalen Islands, *Fernald, Long & St. John*, no. 6797; figs. 9 and 10, var. *curvicarpa*, Laramie Alkaline Lakes, Wyoming, *Nelson*, no. 2821 (cotype); figs. 11 and 12, var. *longipes*, Sasachacha Pond, Nantucket, Massachusetts, *Dame, Jenks & Swan;* figs. 13 and 14, var. *rostrata*, from the original figures of *R. rostellata* (Reichenb. Ic. Crit. ii. t. 174); figs. 15 and 16, var. *onondagensis*, Salina, New York, *J. A. Paine* (type); figs. 17 and 18, var. *subcapitata*, Naushon Island, Massachusetts, *B. M. Duggar* (type); figs. 19 and 20, var. *exigua*, Norris Arm, Newfoundland, *Fernald & Wiegand*, no. 4497 (type).

SOME INTERESTING COLOR FORMS.

Albert Hanford Moore.

The author has long wondered that with some activity in recent years in the matter of naming color forms what is probably the most striking instance of the kind seems to have remained unchristened, namely the red-flowered *Pedicularis canadensis* L. It seems desirable to give it botanical standing.

Some of the most beautiful of our wild flowers are to be found among the rarer shades of flowers familiarly found in other colors, such, for instance, as the pink and white forms of Hepatica which were mentioned already in the writings of Prelinnaean authors. The Hepatica occurring also in Europe, where a more extensive literature on forms exists, it is not possible at this time to say what these should be called, but they have been described as forms. The names thus far known to the author are nomenclatorially incorrect, however. One of the most pleasing of the color variations is the pink Lupine. I have seen a large patch of sandy soil in Andover, Mass., bright with this charming plant, which is called *Lupinus perennis* L. f. *roseus* Britton.[1] In contrast to this is the white form, which the present author first observed growing near it, while the collector of the type specimen found it with the blue. This tricolor series is very frequent in species whose commonest form is blue.

While collecting in West Virginia I obtained a white variant of *Polygonum hydropiperoides* Michx. parallelling the white form of *P. Persicaria* L., called by Millspaugh in his flora of West Virginia [2] *P. Persicaria* f. *albiflora* Millsp.

The names of the forms mentioned above, then, are as follows:

Pedicularis canadensis L. f. **praeclara** A. H. Moore, f. nov. floribus rubris.

Type specimen: Massachusetts, mixed woods, estate of Joseph Fay, Woods Hole, Falmouth, May 28, 1904 (*A. H. Moore*, no. 1670 in Herb. Moore).

Lupinus perennis L. f. roseus Britton, Bull. Tor. Bot. Club, xvii, 124 (May 9, 1890) floribus rubricundis.

[1] Bull. Torr. Bot. Club, xvii, 124 (May 9, 1890). Britton truly describes them, when he says, "Flowers beautifully pink."

[2] W. Va. Agr. Exper. Sta. ii (Bull. no. 24), 432 (June, 1892).

Lupinus perennis L. f. **albiracemus** A. H. Moore, f. nov. floribus albis.

Type specimen: Ontario, West Toronto Junction, June 3, 1893 (*Wm. Brodie*, in Herb. U. S. Nat. Mus.). "Isolated plants numerous with white flowers growing with great patches of the blue."

Polygonum Persicaria L. f. albiflora Millsp. W. Va. Agr. Exper. Sta. ii (Bull. no. 24), 432 (June, 1892) floribus albis.

Polygonum hydropiperoides Michx. f. **leucochranthum** A. H. Moore, f. nov. floribus albis.

Type specimen: West Virginia, Randolph County, clayey swamp, north bank of Tygart's Valley River, Huttonsville, Sept. 23, 1904 (*A. H. Moore*, no. 2507 in Herb. Moore).

Washington, D. C.

SOME ANTENNARIAS OF NORTHEASTERN AMERICA.

M. L. Fernald.

During the fifteen years since our northeastern species of *Antennaria* received detailed study a vast amount of material has accumulated. For the most part this has fallen readily into the categories already defined; but a few plants, especially from eastern Quebec, Newfoundland and Labrador, are so different as to demand special attention. Two of these, *A. eucosma* Fernald & Wiegand and *A. alpina*, var. *cana* Fernald & Wiegand, have recently been defined;[1] but the following have not heretofore been worked out.

Antennaria **pygmaea**, n. sp., nana 3–4.5 cm. alta monocephala humifusa, stolonibus assurgentibus perbrevibus haud elongatis; foliis basilaribus oblanceolatis mucronatis 8–14 mm. longis 2.5–3.5 mm. latis supra glabris vel glabratis subtus laxe lanatis vel glabratis, caulinis circa 9 confertis lineari-oblanceolatis 6–14 mm. longis subtus lanatis supra glabris vel glabratis, apice plano scarioso glabro 1.5–2 mm. longo lanceolato vel anguste deltoideo; involucro femineo hemisphaerico 7 mm. alto 12–13 mm. lato (in specimine siccato) basi lanato; bracteis 5-seriatis valde imbricatis oblongis obtusis, exterioribus fuscis cum apice breve stramineo, interioribus cum apice elongato scarioso stramineo munitis.

[1] Fernald & Wiegand, Rhodora, xiii. 23, 24 (1911).

Dwarf, 3–4.5 cm. high, monocephalous, humifuse; the assurgent stolons very short, not perceptibly elongated: basal leaves oblanceolate, mucronate, 8–14 mm. long, 2.5–3.5 mm. wide, glabrous or glabrate above, loosely lanate or glabrate beneath; the cauline about 9, crowded, linear-oblanceolate, 6–14 mm. long, lanate beneath, glabrous or glabrate above, with a lanceolate or narrowly deltoid glabrous flat scarious tip 1.5–2 mm. long: pistillate involucre hemispherical, 7 mm. high, 12–13 mm. broad (in the dried specimen), lanate at base: bracts in about 5 series, clearly imbricated, oblong, obtuse; the outer fuscous, with a short stramineous tip; the inner with a long obtuse stramineous tip.— Labrador: without definite locality, coll. by members of the *Unitas Fratrum* (type in Gray Herb.); Okkak, *Weitz.*

Related to *A. alpina*, var. *monocephala* (DC.) T. & G. and to *A. glabrata* (Vahl) Greene, but differing from both in the conspicuously imbricated involucre with obtuse paler bracts; those two boreal plants (both occurring also in northern Labrador) having the linear-attenuate bracts uniformly dark-colored and of nearly equal length. It is noteworthy that this involucral character of *A. pygmaea* was recognized by Steetz, who, upon one of the specimens made the note: "Distinguitur facillime a varietate monocephala Ant. alpinae: involucri squamis interioribus obtusis, scariosis, nec acuminatis, coloratis." *A. pygmaea* is the plant referred to by Gray, in the *Synoptical Flora*, as *A. carpatica*, "a monocephalous form!" In its small rosettes of leaves and its involucre, it is, however, quite unlike *A. carpatica* or any of its known allies.

A. **straminea**, n. sp., planta humifusa, stolonibus foliosis perbrevibus vel paulo elongatis (ad 7 cm. longis); foliis basilaribus spathulatis subacutis vix mucronatis 5–12 mm. longis 2–4 mm. latis supra albidis tomento denso minutoque; caule florifero 3–14 cm. alto gracile remote folioso; foliis caulinis 8–10 linearibus 6–14 cm. longis 1–2 mm. latis, mediis attenuatis apice subulato fusco, superioribus apice lineari scarioso; capitulis femineis 1–7 plerumque dense corymbosis hemisphaerico-campanulatis basi rotundatis; involucro 5.5–7 mm. alto 4.5–8 mm. lato (in specimine siccato); bracteis 4–6-seriatis valde imbricatis, exterioribus ovatis vel oblongis brunneis basi paulo lanatis apice tenue chartaceo stramineo obtuso vel subacuto, mediis oblongis apice deltoideo obtuso vel subacuto stramineo, interioribus apice lanceolato eroso stramineo; achaeniis glabris; stylo flavescente deinde brunneo.

Plant humifuse, the leafy stolons very short or slightly elongated (up to 7 cm. long): leaves of the rosettes spatulate, subacute, barely mucronate, 5–12 mm. long, 2–4 mm. broad, white above with dense fine tomentum: flowering stem 3–14 cm. high, slender, remotely leafy: cauline leaves 8–10, linear, 6–14 mm. long, 1–2 mm. wide;

the median attenuate to a dark subulate tip; the upper with a linear scarious tip: pistillate heads 1–7, usually in a close corymb, hemispheric-campanulate, rounded at base: involucre 5.5–7 mm. high, 4.5–8 mm. broad (in the dried specimen), with 4–6 series of very distinctly imbricated bracts: the outer bracts ovate or oblong, brown, slightly lanate at base, with a thin chartaceous stramineous obtuse or subacute tip; the median oblong, with a deltoid obtuse or subacute stramineous tip; the inner with a lanceolate erose stramineous tip: achenes glabrous: style yellowish, becoming brown.— NEWFOUNDLAND: turfy and (calcareous) rocky crests, Twillingate, July 20, 1911, *Fernald, Wiegand & Bartram*, no. 6340 (TYPE in Gray Herb.); limestone barrens near sea-level, Pointe Riche, August 4, 1910, *Fernald, Wiegand & Kittredge*, no. 4140.

A. straminea strongly simulates *A. alpina*, var. *cana* Fernald & Wiegand in its small white foliage but in its involucre is very different, *A. alpina* and its varieties having much larger pistillate heads with long attenuate subequal very dark bracts. *A. straminea* in its foliage and inflorescences also suggests *A. neodioica*, var. *rupicola* (Fernald), discussed below, but that has the larger cream-colored bracts less imbricated and the larger basal leaves with a longer mucro at tip and covered with a much thinner and sparser pubescence.

A. **subviscosa**, n. sp., planta dense humifusa ramis prostratis subligneis interdum 4–5 dm. longis, stolonibus confertis; foliis basilaribus spathulatis obtusiusculis vix mucronatis vel breviter mucronatis 0.5–1.5 cm. longis 2–5 mm. latis dense albido-tomentosis; caule florifero 0.5–1.5 dm. alto omnino albido-tomentoso supra glanduloso-hirsuto; foliis caulinis 7–10 tomentosis, inferioribus lineari-oblanceolatis mucronatis 1.5–2.5 cm. longis, superioribus lineari-attenuatis apice pubescente subscarioso subulato vel involuto; capitulis femineis 3–9 dense vel laxe corymbosis; involucro turbinato-campanulato 5–6.5 mm. alto; bracteis circa 3-seriatis, exterioribus 3–4 mm. longis oblongis subherbaceis virescentibus vel stramineis interdum roseo-tinctis basi glanduloso-viscoso apice tenue obtusiusculo gilvo vel roseo-tincto, interioribus angustioribus acutiusculis.

Plant densely humifuse, the trailing branches subligneous, often 4–5 dm. long; stolons very short and crowded: leaves of the rosettes spatulate, obtusish, scarcely mucronate or with a short mucro, 0.5–1.5 cm. long, 2–5 mm. broad, densely white-tomentose: flowering stems 0.5–1.5 dm. high, white-tomentose throughout, glandular-hirsute above: cauline leaves 7–10, tomentose; the lower linear-oblanceolate, mucronate, 1.5–2.5 cm. long; the upper linear-attenuate, with a subulate or involute subscarious pubescent tip: pistillate heads 3–9, densely or loosely corymbose: involucre turbinate-campanulate, 5–6.5 mm. high: bracts about 3-seriate; the outer 3–4 mm. long, oblong, subherbaceous, greenish or stramineous, often rose-tinged,

glandular-viscid, with a thin obtusish cream-colored or rose-tinged tip; interior narrower, acutish.— Quebec: limestone and limestone-conglomerate ridges from Point aux Corbeaux to Cap Caribou, Bic, July 8, 1907, *Fernald & Collins*, no. 1195 (type in Gray Herb.).

Some material of *A. subviscosa* was distributed as *A. neodioica*, var. *gaspensis* Fernald; but that plant has a prominent mucro at the tip of the rosette-leaves, the upper cauline leaves with a more scarious tip and not at all glandular, and the glandless involucre 8–10 mm. high, with the very thin bracts linear or linear-attenuate and never tinged with pink. *A. subviscosa* is nearest related to the western *A. rosea* (Eaton) Greene and *A. microphylla* Rydberg, from both of which it is quickly distinguished by the glandularity of its upper leaves and inflorescence; its usually fewer heads, with broader and fewer bracts; and its ordinarily fewer cauline leaves, with less pronounced scarious tip. At Bic it was found on a cold north-facing limestone wall, where it was associated with several other localized species: *Carex concinna* R. Br., *Draba hirta* L., *Arabis Holboellii* Hornem., *Potentilla nivea* L., etc.

A. canadensis Greene, var. **spathulata**, n. var., formae typicae habitu statura, etc. similis; foliis basilaribus cuneato-spathulatis vix petiolatis apice rotundatis 1–2.3 cm. longis 4–9 mm. latis; capitulis paucis; bracteis lineari-oblongis apice albescente.

Similar to the typical form in habit, stature, etc., but with the basal leaves cuneate-spatulate, scarcely petioled, rounded at summit, 1–2.3 cm. long, 4–9 mm. broad: heads few: bracts linear-oblong, with whitish tip.— Newfoundland: rocky bed of South Arm River, Holyrood, August 23, 1894, *Robinson & Schrenk;* sandstone ridges and banks, Rushy Pond, August 11, 1911, *Fernald, Wiegand & Darlington*, no. 6362 (type in Gray Herb.); damp talus of limestone sea-cliffs, Pointe Riche, August 4, 1910, *Fernald, Wiegand & Kittredge*, no. 4143.

In *A. canadensis* of Canada and the northeastern states, the basal leaves are of an oblanceolate or narrowly obovate outline, pointed at tip, and constricted below to a petiolar base. All three collections of *A. canadensis* from Newfoundland, from three remote districts, are uniformly different from the true form of the species in the outline of the basal leaves and seem to represent a well-defined geographic variety.

A. neodioica Greene, var. **rupicola** (Fernald), n. comb. *A. rupicola* Fernald, Rhodora, i. 74 (1899).

In its best development *A. rupicola* is distinguished from *A. neodioica* by its much narrower basal leaves, the more numerous and greener cauline leaves, and the heavier or firmer cream-colored or

yellowish mostly oblong involucral bracts. The plant has heretofore been recorded only from the slaty ledges along the Mattawamkeag River in Aroostook County, Maine; but in 1911 it was found in profusion, by Messrs. Wiegand, Bartram, Darlington and the writer, upon the slate and sandstone ledges below the Grand Falls of the Exploits River in Newfoundland and in some abundance on rocks and headlands at other points in eastern Newfoundland. Along the Exploits River both *A. neodioica* and *A. rupicola* are in the greatest abundance and it was there evident that, though very distinct in their extremes, they present numerous transitional tendencies. Since all the Antennarias yet found in Newfoundland are strictly pistillate, with the single exception of the unique *A. eucosma*, the transitions can scarcely be explained as of hybrid origin and it seems wisest to treat *A. rupicola* as an extreme variety of *A. neodioica*. Another interesting extension of its range is furnished by a collection of var. *rupicola* from the rocky shore of the Onaman River in the Thunder Bay District of Ontario, where it was secured by Mr. H. E. Pulling in the summer of 1912. The known area of var. *rupicola* now extends from eastern Newfoundland to northern Maine and northern Ontario.

A. PETALOIDEA Fernald, var **subcorymbosa** (Fernald), n. comb. *A. neglecta*, var. *subcorymbosa* Fernald, Proc. Bost. Soc. Nat. Hist. xxviii. 246 (1898).

When first put forward as a variety of *A. neglecta*, this plant was known only from a single station on Mt. Desert Island, Maine; and it was distinguished from *A. neglecta* by its very tall flowering stems and by "heads loosely subcorymbose on elongated pedicels, the lowest sometimes 6 cm. long: involucral bracts nearly all acute, the inner long-attenuate." Subsequently, when the northern representative of *A. neglecta* with corymbose heads, *A. petaloidea* Fernald,[1] was described, *A. neglecta*, var. *subcorymbosa* was included in it. But during the succeeding fifteen years, while a large amount (about 75 numbers) of *A. petaloidea* and its var. *scariosa* Fernald [2] has accumulated, the original sheet of *A. neglecta*, var. *subcorymbosa* has not been matched in certain characters, which were not at first noticed as peculiar. In true *A. petaloidea*, with the involucral bracts with petaloid white tips, the basal leaves are spatulate and decidedly rounded at summit, and the cauline leaves extend remotely but regularly to the inflorescence. In var. *scariosa*, with the long-attenuate involucral bracts very scarious

[1] Fernald, RHODORA, i. 73 (1899).

[2] Fernald, l. c.

(not petaloid) and lustrous, the basal leaves are somewhat oblanceolate and acutish, and the cauline, as in true *A. petaloidea,* extend regularly to the inflorescence. In the original Mt. Desert sheet of *A. neglecta,* var. *subcorymbosa* the basal leaves are oblanceolate and acutish as in *A. petaloidea,* var. *scariosa,* but the involucral bracts have petaloid tips as in true *A. petaloidea.* In the Mt. Desert plant, however, the leaves extend half or two-thirds up the flowering stem, above which point the stem is naked or nearly so until just below the inflorescence, giving the corymb a long-peduncled aspect.

This nearly naked summit of the flowering stem is of interest because in the only Newfoundland *Antennaria* yet known with elongate creeping stolons this character reappears; and the Newfoundland material, though with larger leaves and ordinarily longer pedicels, has the outline of the basal leaves and the texture of the involucre exactly as in the original of *A. neglecta,* var. *subcorymbosa.* Similarly, the only material of this group yet known from Nova Scotia, a fine suite of specimens collected by Mr. Harold St. John at Sunny Brae, Pictou County, is quite like the Mt. Desert and Newfoundland plants in its details; and, as indicated by the field-experience of Mr. St. John and the writer during June and July of the present year, the commonest *Antennaria* on the eastern half of Prince Edward Island is quite like the Mt. Desert and Nova Scotian plant and they all belong with the northern *A. petaloidea* rather than with the more southern *A. neglecta.* This pronounced variant with acutish leaves, tall flowering stems (3–4.5 dm. high) nearly or quite naked for a long distance (commonly 10–15 cm.) below the inflorescence, long pedicels (the lowest commonly 2.5–17 cm. long), and somewhat petaloid involucral bracts, is, then, the representative of *A. petaloidea* along the southeastern border of its range, from Mt. Desert Island to Prince Edward Island and Eastern Newfoundland.

Gray Herbarium.

A NEW COCHLEARIA FROM NEWFOUNDLAND.

S. F. Blake.

Cochlearia **cyclocarpa**, n. sp., a basi ramosa caulibus multis adscendentibus 11–24 cm. altis; foliis rosulae deltoideo-ovalibus integris vel leviter sinuato-dentatis basi truncatis vel cordatis 1–1.5 cm. longis latisque, petiolis 5–8 cm. longis; foliis caulinis inferioribus ovalibus vel oblongis obtusis sinuate paucidentatis in petiolos marginatos angustatis vel subsessilibus 1.5–2.5 cm. longis, superioribus sensim minoribus plerumque hastate 3–5-dentatis vel rare ovalibus integris leviter amplectentibus; racemis 2–10 cm. longis; pedicellis patentibus vel adscendentibus 5–15 (plerumque 7) mm. longis; sepalis oblongis 2 mm. longis; petalis albis obovatis 3 mm. longis ad medium in unguiculum angustatis; siliculis valde reticulatis vix inflatis rotundatis vel depresso-rotundatis 5–7 mm. longis latisque; seminibus in quoque loculo 6 longitudine 1.5 mm.; stylo in ovario 0.5 mm. in fructo 0.8 mm. longo.

Branching from the base, with many ascending stems 11–24 cm. high: leaves of the rosette deltoid-oval, entire or slightly sinuate-dentate, truncate or cordate at base, 1–1.5 cm. long and wide; petioles 5–8 cm. long: lower cauline leaves oval or oblong, obtuse, sinuately, few-toothed, narrowed into margined petioles or subsessile, 1.5–2.5 cm. long; the upper gradually smaller, mostly hastately, 3–5-toothed or rarely oval and entire, slightly clasping: racemes 2–10 cm. long: pedicels spreading or ascending, 5–15 (commonly 7) mm. long: sepals oblong, 2 mm. long: petals white, obovate, 3 mm. long, narrowed at the middle into a claw: siliques obviously reticulated, scarcely inflated, round or depressed-orbicular, 5–7 mm. long and wide: seeds 6 in each cell, 1.5 mm. in length: style 0.5 mm. long when young, 0.8 mm. long in fruit.— Newfoundland: wet conglomerate limestone and calcareous sandstone cliffs and ledges, Cow Head, 23 July, 1910, *Fernald & Wiegand*, no. 3467 (type in Gray Herb.); moist sea cliffs, Western Head, New World Island, 20 July, 1911, *Fernald, Wiegand & Bartram*, no. 5480; Baccalieu Island, Barred Islands, and Fogo Island, Notre Dame Bay, 1902, 1903, *J. D. Sornborger*.

This species, which is most closely related among described species to *Cochlearia anglica* L., as which it has been passing in American literature, differs from that plant in its circular less reticulate pods, its smaller frequently cordate basal leaves, much shorter style, and smaller flowers. In *C. anglica* the rosette-leaves are ovate or oval-oblong, large, cuneate or often rounded or sometimes truncate into the petiole, the pods are ellipsoid and typically much larger (rarely

one or two of the lower ones suborbicular), the style is mostly much longer (1–2.2 mm. long), and the petals are generally about 6 mm. long and much more conspicuous than in *C. cyclocarpa.*

London, England.

Paspalum in Eastern Connecticut.— *Paspalum psammophilum* occurs on both banks of the Shetucket at Baltic, in the town of Sprague, a station reported by Dr. C. B. Graves in the recent Connecticut Catalogue. This species grows here on dry, coarse gravel, which in many places is nearly destitute of other vegetation. It becomes fully prostrate about Spetember 1st, when the culms of a vigorous plant radiate over a circular area from 1. to 1.5 meters in diameter. After visiting this station in early September, 1913, I took the trolley down the river, stopping first at Versailles, three miles south. The same *Paspalum* was abundant here on the dry gravelly banks of the river. The next stop was at Taftville, two miles farther south, where a brief search revealed the same species growing in fine sand. My plan had been to follow the Shetucket to its entrance into the Thames at Norwich, some three miles beyond, but with a shower threatening, it seemed advisable to return.

There is a fine station for *P. circulare*, a few miles west of Sprague, in the adjoining town of Franklin. This station is on the banks of the Yantic, another tributary of the Thames. The soil here is a moist rich alluvium, quite unlike the dry, barren sand and gravel of the Shetucket, on which *P. psammophilum* was collected.

The stations mentioned are of interest as showing the two species following up the rivers from the coast. Baltic, the most northerly station, is twenty-two miles from Long Island Sound, or eight miles from Norwich, the head of the Thames, which is a tidal stream. The station on the Yantic is three miles above Norwich. Specimens have been deposited in the Gray Herbarium.— R. W. Woodward, New Haven, Connecticut.

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Ruppia maritima and North American Varieties.

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NYMPHAEA VARIEGATA OR N. AMERICANA?

M. L. Fernald and Harold St. John.

In 1902, Mr. G. S. Miller, Jr., pointed out that the northern Yellow Pond Lily, which had passed as *Nuphar advena*, var. *variegatum* (more recently as *Nymphaea advena*, var. *variegata*), differs from the plant of the southern Coastal Plain in several characters and is a distinct species of boreal range, *Nymphaea variegata* (Engelm.) G. S. Miller.[1] This species is separated from the southern *N. advena*, which has the leaves erect ("occasionally floating in deep water"), on subcylindric petioles, and with a broad sinus, by its floating leaves on "flattened" petioles, and with a closed or narrow sinus. In *N. advena*, furthermore, the inner surface of the sepals is ordinarily suffused with green, in *N. variegata* ordinarily with reddish-purple; in *N. advena* the larger fruit is ordinarily green throughout, in *N. variegata* commonly suffused with red.

Later, in their "*North American Species of Nymphaea*,"[2] Miller & Standley add other contrasting characters, as, for instance, the more constricted neck of the capsule and the slightly smaller seeds of the northern plant; and study of the available material of the plants has satisfied us that, although some of the statements of characters have been overdrawn and the name finally adopted by Miller & Standley for the northern plant has little to support it, the two plants themselves are well marked species. Since others may have encountered the same difficulties that we have in making the specimens fully coincide with the published characters and in following the logic of

[1] G. S. Miller, Jr., Proc. Biol. Soc. Wash. xv. 13 (1902).
[2] Miller & Standley, Contrib. U. S. Nat. Herb. xvi. pt. 3 (1912).

taking up a new combination in place of *Nymphaea variegata,* it seems appropriate to record our conclusions.

Since Miller's original publication of *Nymphaea variegata,* an earlier specific name, interpreted as belonging to it, has come to light and the northern plant with floating leaves is rechristened *Nymphaea americana* (Provancher) Miller & Standley,[1] based upon *Nuphar americana* Provancher, Fl. Can. 28 (1862), "excluding synonyms." *Nymphaea variegata* or *N. americana* is described by Miller & Standley as having "Floating leaves usually 17 to 28 cm. long and 11 to 22 cm. wide." This statement of the measurements is very unfortunate, for to those who are familiar with the plant in the area of its greatest development, British America and the northernmost States, it must immediately throw an unnecessary doubt upon the value of the species. Throughout the region from Labrador and Newfoundland to northern Ontario and northern New England, where *N. variegata* grows in nearly every pond, dead-water or shallow pool, it very rarely attains the dimensions assigned it. Of the numerous Newfoundland specimens examined by us (some of them cited by Miller & Standley as coming from "*Canada*") not one has the floating leaves (dried) more than 11 cm. long, the Newfoundland series showing a variation in size from 6–11 cm. long by 5–8.5 cm. broad; and, although these measurements are from herbarium specimens, it is highly improbable, judging from the ordinary shrinkage of *Nymphaea* leaves under pressure, that the Newfoundland plant ever attained the dimensions assigned by the authors of *N. americana.*

It is not, however, desirable to separate from *N. variegata* or *americana* this small-leaved Newfoundland material for it is clearly the reduced northern state of a species which toward the southern edge of its range becomes much larger and there agrees with the prescribed measurements given for the species. Such small-leaved specimens are known not only from Newfoundland but are the characteristic form from the northern edge of the range, as, for instance, at Nouvelle, Quebec and at North Sydney, Cape Breton (specimen cited, through a clerical error, by Miller & Standley as the basis of the species in British Columbia). And of 43 collections of the plant seen by us from New England 21 have their largest leaves well under 17 cm. in length.

The name *Nymphaea variegata* (Engelm.) G. S. Miller, for the

[1] Miller & Standley, l. c. 78.

northern plant, based upon a well rendered and unquestioned diagnosis as well as upon definite specimens, is open to no doubt; but when the name *N. americana* was brought forward it rested upon a very insecure basis. Miller & Standley (p. 67) state of *Nuphar americana* that "Although intended merely as a substitute for *advena*. . . .The diagnosis clearly refers to the northern plant, and the type locality, Lake St. Jean-Georgie, Quebec, is far beyond the range of *Nymphaea advena*." This should dispose of the matter, but unfortunately the Provancher description, etc. seem to have been misinterpreted, and it therefore becomes important to see exactly what Provancher said:

"NÉNUPHAR. *Nuphar*. Smith.

. . . .

1. **N. d'Amérique**. *N. Americana*.— *N. advena* Ait.— *Nymphaea advena*. Michx.— (*Lis jaune des étangs. Volet*).— Yellow Pond-Lily.— ♃ Feuilles épaisses, en coeur, de 6′–10′ de long, à lobes divergents, luisantes, flottantes, ou le plus souvent dressées, à pétioles aplatis ou demi-cylindriques. Calice à 6 sépales, les extérieurs plus petits. Stigmate à 12–15 rayons, à bords crénelés, légèrement ombiliqué. Fleurs globuleuses, dressées, portées sur de longs pédoncules droits, charnus. Pétales et étamines jaunes. Fruit ovoïde-oblong, fortement sillonné, tronqué au sommet.— Lac St. Jean — Géorgie, dans les vases des lacs et des marais. Lac St. Joachim! Juin-Août.

a tomentosa. Nutt. Feuilles pubescent blanchâtre en dessous.

Le nom spécifique *advena* qui convient aux Européens étant un contre-sens pour nous, nous avons cru devoir lui substituer celui d'*Americana*." [1]

It is, as stated by Miller & Standley, clear that Provancher merely intended *Nuphar americana* as a substitute for the inappropriate name *N. advena;* and it is therefore clear that he had no intention of proposing a new species to be segregated from it. However, since Provancher's intent in the matter seems to have had little weight and he is now made the posthumus sponsor for a new species which he did not understand, as well as for the new name which he *did* understand, it becomes necessary to view the remaining evidence; for we are told that Provancher's "diagnosis clearly refers to the northern plant."

As previously stated by Miller, in the northern plant "floating leaves are the invariable rule." [2] This is made the key-character in the later treatment and the species is further characterized by having the leaves with "sinus . . . . closed or very narrow" and "petioles slender, conspicuously flattened." An inspection of Provancher's descrip-

[1] Provancher, Flore Canadienne, 28, 29 (1862).

[2] Miller, Proc. Biol. Soc. Wash. xv. 11.

tion, however, gives us the characters: "leaves with the lobes divergent, ...floating, or more often erect, with petioles flattened or subcylindric (feuilles....à lobes divergents,....flottantes, ou le plus souvent dressées, à pétioles aplatis ou demi-cylindriques)." These characters belong, then, chiefly to the southern *N. advena*, which has leaves erect (or "occasionally floating in deep water") with divergent lobes and subterete petioles, rather than to the northern species with floating leaves with narrower or closed sinus and "conspicuously flattened" petioles, though it is possible that Provancher's "pétioles aplatis" referred to the latter; but it is obvious that Provancher's "leaves with the lobes divergent" and "more often erect" throw the greater part of his diagnosis of the foliage to the southern *N. advena;* for the *less often* floating leaves cannot be taken as *clearly* indicating the northern plant, since the southern *N. advena* has them "occasionally floating in deep water." The floral characters given by Provancher are inconclusive, for his "Stigmate à 12–15 rayons, à bords crénelés" might belong to either the northern plant, described by Miller and Standley with "stigma rays 7 to 25" and with "margin of the disk definitely although not deeply crenate"; or to the southern with "stigmatic disk...entire, faintly undulate....stigma rays.... from 9 to 23." And Provancher's description of the fruit as "strongly furrowed (fortement sillonné)" inevitably suggests the southern *N. advena,* with its "fruit....with conspicuous longitudinal ribs," quite as vividly as it does the northern plant, with "fruit....less strongly ribbed." Provancher's diagnosis was, then, like the name, *Nuphar americana,* intended to cover the aggregate *N. advena* of his day and not to distinguish a northern species different from the southern. This is further indicated by the broad range given by Provancher, "Lake St. John to Georgia," for surely Georgia is well within the range of true *N. advena* and far south of the limits of *N. variegata,* while Lake St. John is near the northern limit of the latter species. The interpretation by Miller & Standley of Provancher's broad range as "the type locality, Lake St. John-Georgie, Quebec,....far beyond the range of *Nymphaea advena,*" is apparently due to a misreading of the original text; for Provancher, like the author of any other Manual, was merely giving the ranges, not the type localities, of the species included, but he frequently cited stations near the city of Quebec where he knew the plant. This fact, obvious on almost any page of his *Flore*, is illustrated not only by *Nuphar americana* but by the immediately preceding and immediately following species:

Nymphaea odorata. "Québec-Lac Supérieur, dans les lacs où les eaux mortes. Lac Calvet à St. Augustin! Lac St. Pierre!"

Nuphar Kalmiana. "Baie d'Hudson-Lac Supérieur; marais et mares. Bécancour!"

It should be clear then, it would seem, that Provancher's *Nuphar americana* was merely the mixed *N. advena* of his day, but with its characters chiefly drawn from descriptions of the southern plant; and that in using the name *N. americana* he was, as he said, merely substituting an appropriate name for the highly inappropriate one originally given by Aiton. There seems to be, therefore, no good reason why we should take up the name *Nymphaea americana* (Provancher) Miller & Standley for the perfectly clear and unquestioned *N. variegata* (Engelm.) G. S. Miller.

PLURAL SEEDS IN ACORNS.

John G. Jack.

Concerning the interesting note by Mr. Charles Piper Smith, in the February number of Rhodora, p. 41, upon "Plurality of Seeds in Acorns of *Quercus prinus*," it may be well to recall that one of the first, if not the first, in this country to publish a statement concerning this peculiarity was the late Mr. Thomas Meehan, of Philadelphia.

Mr. Meehan is recorded, in the Proceedings of the Academy of Natural Sciences, Philadelphia, 1871, pp. 155–157, as stating at a meeting of the Academy that, "In the case of *Quercus robur* a plurality of plantlets from one sprouting seed was not uncommon. He had found dozens in a peck of seed. These were usually in twos, but occasionally in threes. Of the last he exhibited only one specimen. He had examined a half peck of sprouting acorns of *Quercus palustris* and another of *Quercus macrocarpa*, but in these he could detect no sign of variation — each seed seemed cleft smoothly and directly through the center into two regularly equal halves." In *Quercus rubra* he did not find a plurality of embryos although numerous specimens were examined, but he refers to the frequent partial division of the cotyledons by two, three, or four fissures as being remarkable.

The observations made by Mrs. E. G. Britton, and referred to by

Mr. Smith, concerned a "double" White Oak (*Quercus alba*) seedling found on Staten Island in March, 1886. Her note was published in the "Bulletin of the Torrey Botanical Club," vol. XIII, June 1886, p. 95.

Professor Francis E. Lloyd in observations upon germinating acorns of *Quercus garryana* in western Oregon, under the title "Teratological Notes," published in the Bulletin of the Torrey Botanical Club, vol. XXII, 1895, p. 397, says "A number of acorns have been found with two fertilized and developed ovules. The presence of the supernumerary seed is betrayed by the unsymmetrical shape of the acorn. The rightful occupant — if might makes right — is usually well developed and pushes out its radicle earlier than does the intruder, which is correspondingly smaller and flattened and twisted out of shape. Occasionally, when the supernumerary seed is large, if its position is favorable it gets its radicle out of the ruptured apex first. At all events it makes a brave effort to reach soil and sunlight. A few acorns have been found in which the two plantlets had developed into two well-formed seedlings. Acorns containing more than one seed have all been found under young trees. In no case have I found such under aged trees."

Without reference to the records above cited, as well as those made by European observers, I had from my own observations considered the development of plural seeds in acorns so common, particularly in some species of oak, such as *Quercus rubra*, that I have accepted it as a perfectly natural and frequent phenomenon worthy of being considered incidentally by the arboriculturist or silviculturist, and for many years I have called the attention of my students in forestry to these common exceptions to the general rule, since they have a direct bearing upon practical silviculture.

Plural seeds appear to be most common among, if not almost confined to, species of Oaks having naturally large fruits. In northeastern America the Red Oak probably averages larger fruit than any other species and, in my experience, this tree is likely to show, more than others of the region, a larger proportion of fruits producing plural seeds. I think this tendency is indicated in our natural woods by the fact that Red Oaks so often are double trunked, a feature not confined to this species of course, in fact not rarely seen in White Oak and Chestnut Oak and others. Also it must be borne in mind that double trunks may and often do develop because of some accident to the

plumule, causing the growth of two stems from the buds in each axil of the cotyledons, or of two or more than two stems when a well developed young seedling is broken off near the ground or nipped off by some animal or insect. Two or more acorns, also, when planted close together, may produce a plural trunk effect when the trees are old. But on an examination of the trees in a piece of woodland, where all species have had seemingly equal chance, it will often be found that the Red Oak shows a larger percentage of plural trunked trees than other species.

While we have often noted plural stems in seedling Red Oaks in nursery beds no examination has ever been made to show what percentage of the fruits contained more than one fully developed seed from the six ovules which are normally produced in each flower.

Since reading Mr. Smith's note, however, I have thought it might be worth while to get actual figures. Last autumn we had collected in the Harvard Forest, at Petersham, Mass., about half a bushel of Red Oak acorns for planting this spring. These acorns have been kept in a cool place and are in good fresh condition. They were collected from good healthy trees, growing in the open, in the prime of life and vigor, broad spreading and low branched. The acorns may be described as medium sized, being about half the size of the largest sometimes found and nearly double the size of the smallest of well developed acorns found on this species. As they were collected from several trees they show some, though but little, variation in size. From over a quart of acorns taken at random from the half bushel collected last autumn at the Harvard Forest, I have cut and examined two hundred with the following results. 139 acorns with single seeds, and 61 acorns with plural seeds.

Of those with plural seeds 58 contained two developed seeds in each and 3 contained three seeds. Most of those with two seeds had both seeds strong and well developed; in those with three seeds the third seed was generally much crowded and with much reduced cotyledons, in one case being diminutive and crowded into the centre of the acorn and almost completely surrounded by the cotyledons of the two highly developed seeds. The cotyledons of each seed are often very unequal and very unsymmetrical in the fruits with plural seeds.

In all cases where two seeds were found in the acorn they were both apparently sufficiently strong and well developed to grow with nearly equal vigor and to produce two trunks. So far as could be detected

from outward appearances the acorns containing plural seeds did not differ in shape or size from those with single seeds. Possibly the larger acorns when picked out showed more tendency to double seeds but, if so, the difference was slight. Here we have an ordinary chance case which upon examination shows over 30% of the acorns with plural seeds. This is sufficient proof of the frequency of the occurrence. It may be stated that the plural seeds are always at once easily distinguished or separated by the thin testa or seed coat which surrounds and separates them, so that however crowded or mis-shapen they may be there is no reason to confuse the seeds or pairs of cotyledons which are always contained in their own testal envelope.

While some small fruited species, like *Quercus palustris*, probably rarely, if ever, produce plural seeds, it is likely that the tendency will be found in many species in varying degree; probably also influenced by the age or vigor of the trees and the ecological conditions under which they grow.

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THE AMERICAN VARIATIONS OF STELLARIA BOREALIS.

M. L. Fernald.

Stellaria borealis Bigelow presents in North America such pronounced variations that it has seemed desirable to attempt some organization of them, especially as the major varieties have rather definite and natural geographic ranges. Through much of the range of the species in North America the leaves are linear-lanceolate or lanceolate, the primary ones 2.5–8 cm. long; but in certain districts of both the Northeast and the Northwest there are varieties with short ovate, ovate-lanceolate or elliptic-lanceolate leaves only 0.7–2.5 cm. long.

The plants with elongate linear-lanceolate or lanceolate leaves have ordinarily been treated by American authors as *S. borealis*, which has been divided into a supposedly typical form, with the flowers axillary and the upper leaves scarcely reduced, and a variety "*alpestris*" or "*corollina*" with a loosely cymose inflorescence and the

upper leaves much reduced to scarious-margined bracts. These two tendencies of the species, though sometimes difficult to make out, are for the most part fairly pronounced, but a more significant character is found in the length of the mature calyx and capsule.

In the Northeast, from Labrador to Pennsylvania and the Great Lakes, and locally to the Rocky Mountains, *Stellaria borealis*, whether with only few axillary peduncles or with terminal many-flowered cymes has the mature calyx almost without exception 2–3.5 (rarely 4) mm. long and the mature (but unopened) capsule 3–5 (rarely 5.5) mm. long. In the extreme West, however, from the Behring Sea region to California, the mature calyx of both the plant with few axillary peduncles and the one with the terminal cymes, is 4–5.5 mm. long, the mature capsule 5–8 mm. long. These measurements indicate, then, that in the size of the calyx and the capsule the species breaks into actual geographic trends. The only notable exception, and that only apparently an exception, is the occurrence of plants with the large calyx and capsule on the lower St. Lawrence, from Bic to Anticosti, a region in which three-fourths of the vascular plants show identities or close affinities with the flora of the Northwest.

A glabrous plant with short ovate to elliptic-lanceolate leaves ordinarily less than 2.5 cm. long occurs from Greenland and Labrador to New England and New York, with us oftenest in alpine or boreal districts, and from Alaska to the mountains of Oregon, in Oregon and Washington being regarded as an alpine or subalpine species. This is the plant described by Bongard as *Stellaria calycantha* [1] and treated by some authors as identical with *S. borealis*, by others as a variety of it and by recent American authors as a distinct species of the Northwest.

Another variant, resembling *Stellaria calycantha* but with the young branches covered with dense crisp pubescence, is found on the mountains from Washington to northern California and eastward to Montana. This is the plant described by Howell as *Alsine Simcoei*,[2] which seems to be a pubescent extreme parallel with pubescent variants found in many other species of the *Alsineae*.

In the main these six variations of *Stellaria borealis* are well-marked and should be recognized in intensive studies of our flora; but, though some of them have been set off as species, they all show too many

[1] Bongard, Vég. Sitch. 127 (1832).
[2] Howell, Fl. N. W. Am. i. 83 (1897).

transitional tendencies to warrant their treatment as more than varieties.

The earliest publication of the species seems to have been by Michaux, who named the form with linear-lanceolate leaves and cymose small flowers *Spergulastrum lanceolatum.*[1] Michaux's plant, said to grow "in borealibus Americae septentrionalis," was actually collected, as shown by Michaux's herbarium, on the Saguenay River and Lake Mistassini. By Persoon[2] the Michaux plant was transferred to *Micropetalon* and by Torrey[3] to *Stellaria*, but owing to the existence of an earlier valid species, *Stellaria lanceolata* Poir.[4] from the Straits of Magellan, Michaux's name cannot be retained for the species under *Stellaria.*

In 1812 Ledebour published *Arenaria calycantha*[5] from Siberia and in 1832 Bongard, describing from Sitka the plant with short ovate leaves already referred to, called it *Stellaria calycantha,*[6] basing his name upon Ledebour's *Arenaria calycantha.* Subsequent authors for the most part treated *Stellaria calycantha* as identical with *S. borealis*, but Fries in 1842 accorded it varietal rank as *S. borealis*, var. *calycantha.*[7] In 1883, however, *S. calycantha* was revived as a species by Professor John Macoun who said, "Specimens. . . .are altogether unlike any form of *S. borealis* we possess. The character, 'leaves ovate-lanceolate, connate, the margin minutely ciliate with white hairs, much shorter than the internodes,' separates it from that species."[8] And in 1897, in the Synoptical Flora, Robinson, following Macoun, took up *S. calycantha* as seemingly a distinct species separated by "Leaves broader, ovate or broadly oblong, seldom an inch long."[9] If the extreme western material alone were under consideration *S. calycantha* could be easily kept apart from the plants with linear-lanceolate leaves, for *S. calycantha* has small flowers, the mature calyx 2–4 mm. long, the capsule 3–4.5 mm. long; while, as already pointed out, the extreme western plants passing as *S. borealis* have larger flowers, the calyx 4–5.5 mm., the capsule 5–8 mm. long. In the Rocky Mountains and the Northeast, however, numerous transitions

[1] Michx. Fl. Bor.-Am. i. 275 (1803).
[2] Pers. Syn. i. 509 (1805).
[3] Torr. Fl. i. 453. (1824).
[4] Poir. Encyc. vii. 416 (1806).
[5] Ledeb. Mém. Acad. Sc. Pétersb. v. 534 (1812).
[6] Bong. Vég. Sitch. 127 (1832).
[7] Fries, Novit. Fl. Suec. Mant. iii. 196 (1842).
[8] Macoun, Cat. Can. Pl. i. 75 (1883).
[9] Robinson in Gray, Syn. Fl. i. 235 (1897).

occur which leave no single character that can be held as belonging alone to one or another of these plants.

Furthermore, it is very improbable that Bongard's Sitkan *Stellaria calycantha* had anything to do with the Siberian *Arenaria calycantha* of Ledebour with which it has been universally identified and from which it derived its specific name. Were it not practically certain that Bongard had before him and described a different plant, the name *calycantha*, originating in 1812, would have to be taken up as the specific name for the complex species. But an examination of Ledebour's original description of *Arenaria calycantha* shows that he had a plant, possibly a true *Arenaria*, with two ovate bracts toward the summit of each peduncle. Ledebour's diagnosis of the species and his descriptions of the peduncle follow:

> "A. foliis oblongis acutis sessilibus basi ciliatis, pedunculis axillaribus unifloris diphyllis.
>
> . . . .
>
> Pedunculi terminalis et axillares, uniflori, supra medium diphylli.
> Flores nutantes, interdum bractea ovata, acuta, calyce majori suffulti." [1]

Although Bongard supposed his Sitkan *Stellaria calycantha* to be *Arenaria calycantha* Ledeb., it is clear from his account that he had not seen material of Ledebour's species but depended upon a determination by Meyer "(fide amiciss. D. Meyer, qui specimina originalia videt)." But Bongard's own species, based on Mertens's material from Sitka, has, as shown by a cotype in the Gray Herbarium labeled by Bongard himself as well as by his description, naked peduncles and is the plant of the Northwest which has been correctly identified with *S. calycantha* Bong.; but it obviously is not *Arenaria calycantha* Ledeb.

The Bongard *S. calycantha* of the Northwest, as already stated, reappears in the Northeast, being the short-leaved plant so familiar in the alpine region of the White Mountains; and, although *S. borealis* has of late been interpreted in America as a plant with elongate linear-lanceolate leaves, it becomes evident from Bigelow's original description that he had the White Mountain plant which closely matches *S. calycantha* Bong. The significant portion of Bigelow's description of *S. borealis* was as follows:

> "Stellaria borealis *Northern Stellaria.*
> *S. foliis ovali-lanceolatis; pedunculis axillaribus, elongatis, unifloris; petalis calyci subaequalibus.*
>
> . . . .

[1] Ledeb. l. c.

This plant generally occurs without petals, in which state I discovered it on the White Mountains in July, 1816. I have since received it several times from the same place but always in the apetalous state, until last year, when Messrs. Greene and Little found it there in August with complete flowers."[1]

S. borealis, in this typical short-leaved form, appears to be a circumpolar plant, occurring outside North America, in Scandinavia, Russia, Siberia and Kamtschatka. But so far as the writer can determine the other American variations of the species are endemic.

The common lowland plant of the East, with elongate linear-lanceolate leaves and well-developed cyme, *Spergulastrum lanceolatum* Michaux, has, along with the larger-flowered cymose-paniculate plant of the Northwest, been confused with Fries's *Stellaria alpestris* and with Fenzl's *S. borealis, β. corollina;* but neither of these names can be safely applied to either of the North American plants.

S. alpestris, as first published by Fries in 1832, was based upon two plants previously published as varieties of *S. uliginosa* by Hartmann and by Laestadius. These two plants were treated by Fries as *S. alpestris* "α. foliis omnibus conformibus" and *S. alpestris* "β. foliis ad axillas caulis in bracteas suppressis, unde caulis apice paniculatus"[2] Later, however, in 1842, Fries[3] reduced his former *S. alpestris* α to *S. borealis*, var. *corollina* Fenzl, while an apetalous state which Fries in the meantime had distributed as *S. alpestris*, var. *aliflora*[4] was reduced to *S. borealis*, var. *calycantha* (Bong.) Fries. At the same time Fries restricted his *S. alpestris* to the Scandinavian plant with paniculate inflorescence, his earlier *S. alpestris* β which he had subsequently distributed as *S. alpestris*, var. *paniculata*,[5] and redefined the plant as a species distinct from *S. borealis*. Subsequent European authors have treated this emended *S. alpestris*, sometimes as a distinct species, sometimes as a variety of *S. Friesiana* Fenzl, and again as a hybrid of *S. borealis* and *S. Friesiana*. Authentic material of the plant from Laestadius and from Andersson shows it to be unlike either of the American plants with which it has been identified and there seems to be no reason why the name *alpestris* should be longer used for either of our plants with cymose inflorescences.

[1] Bigelow, Fl. Bost. ed. 2, 182, 183 (1824).
[2] Fries, Nov. Fl. Suec. Mant. i. 10 (1832).
[3] Fries, l. c. iii. 194–196 (1842).
[4] Fries, Herb. Norm. III. no. 31.
[5] Fries, l. c. VII. no. 34.

The other name which has been used for the two American plants with cymose-paniculate inflorescences is *S. borealis*, var. *corollina* Fenzl.[1] This supposition, that Fenzl's var. *corollina* was a plant with paniculate inflorescences, doubtless came about through his citation under it of *S. alpestris* Fries, which, as already shown, was two different species, and of *S. brachypetala* Bong; but there is nothing in Fenzl's treatment to indicate that he was establishing var. *corollina* for a plant with a paniculate inflorescence. On the contrary, he divided *S. borealis* into two varieties based merely on the presence or absence of petals: "*α. apetala:* floribus omnibus v. plurimis apetalis," etc., and "*β. corollina:* floribus omnibus 5 petalis v. paucissimis 3 petalis," etc.[2] Under each of his thus constituted varieties Fenzl distinguished some forms: of "*β corollina*" "*Lusus 1.* Calyces 1–1½ lin. longi. Caules plerumque abbreviati debiles" and "*Lusus 2.* Calyces plerumque 2 lin. longi. Caules saepe erecti longifolii elongati"; and in his citation of *S. brachypetala* Bong. as belonging to var. *corollina* he further indicates that it is "Lus. 2." Subsequent European authors have interpreted var. *corollina* merely as the form of *S. borealis* with petals and there is no clear reason why we should do otherwise. To be sure, Fenzl cited as belonging to his var. *corollina*, lusus 2, *S. brachypetala* Bongard with its "*Cyma* dichotoma";[3] but as the second form of his variety *S. brachypetala* can hardly be accepted as thoroughly typical of it. This plant, *S. brachypetala* Bong., is, as indicated by Fenzl, one of the large-flowered Northwestern varieties, and Bongard's descriptive phrase "*Cyma* dichotoma," may be taken as a fair indication that he had the large-flowered plant with loose cymes. There was, however, an earlier and quite different *S. brachypetala* of Bunge[4] from the Altai and on this account Bongard's *S. brachypetala* was renamed by Steudel *S. sitchana*,[5] which seems to be the first name for our large-flowered cymose plant free from incumbrances.

The other large-flowered plant, the variety with essentially uniform long leaves and scattered axillary flowers, was described from Mertens's Sitka material by Bongard as *S. longifolia* Muhl. But Bongard's description and a sheet of the Mertens collection in the Gray Herbarium show that it is the large-flowered plant which in the extreme

[1] Fenzl in Ledeb. Fl. Ross. i. 382 (1842).
[2] Fenzl, l. c.
[3] Bong. Vég. Sitch., 126 (1832).
[4] Bunge in Ledeb. Fl. Alt. ii. 161 (1830).
[5] Steud. Nom. ed. 2, ii, 637 (1841).

Northwest has been passing as *S. borealis* and that it cannot be placed with the earlier-described *S. longifolia* Muhl.

The American variations of *Stellaria borealis* here discussed may be distinguished as follows.

Mature calyx 2–3.5 (rarely 4) mm. long: mature but unopened capsule 3–5 (rarely 5.5) mm. long.
  Leaves ovate, ovate-lanceolate or elliptic-lanceolate, the primary ones 0.7–2.5 cm. long.
    Branches glabrous or essentially so................1. *S. borealis.*
    Branches densely pilose.........................2. var. *Simcoei.*
  Leaves lanceolate to lance-linear, the primary ones 2.5–5.5 cm. long.
    Upper leaves long and but slightly reduced, herbaceous throughout; flowers few, axillary and terminal...........3. var. *isophylla.*
    Upper leaves much reduced to short scarious-margined bracts: flowers numerous in terminal cymes..............4. var. *floribunda.*
Mature calyx 4–5.5 mm. long: mature capsule 5–8 mm. long: leaves lanceolate to lance-linear, the primary 2.5–8 cm. long.
    Upper leaves long and but slightly reduced, herbaceous throughout: flowers few, axillary and terminal...........5. var. *Bongardiana.*
    Upper leaves much reduced to short scarious-margined bracts: flowers numerous in terminal cymes.............6. var. *sitchana.*

1. S. borealis Bigel. Fl. Bost. ed. 2, 182 (1824). *S. alpestris a* Fries, Nov. Fl. Suec. Mant. i. 10 (1832). *S. calycantha* Bongard, Vég. Sitch. 127(1832); T. & G. Fl. N. A. i. 186 (1838); Macoun, Cat. Can. Pl. i. 74 (1883); Robinson in Gray, Syn. Fl. i. 236 (1907); not *Arenaria calycantha* Ledeb. Mém. Acad. Sc. Pétersb. v. 534 (1812). *S. borealis,* var. *calycantha* Fries, Novit. Fl. Suec. Mant. iii. 196 (1842), in part. *Alsine borealis* Britton, Mem. Torr. Bot. Cl. v. 149 (1894), in part.— Wet or cool, often shaded situations; circumpolar. In North America from Greenland and Labrador to Alaska, south to Newfoundland, New Hampshire, western Massachusetts, central New York, Alberta and Oregon; southward often alpine or subalpine.

2. Var. **Simcoei** (Howell), n. comb. *Alsine Simcoei* Howell, Fl. N. W. Am. i. 83 (1897).— Alpine and subalpine habitats, Washington to Montana and northern California.

3. Var. **isophylla**, n. var., caulibus flaccidis 0.3–4 dm. longis; foliis lanceolatis vel lanceolato-linearibus omnibus conformibus vel subconformibus, primariis 2.5–5.5 cm. longis 2.5–7 mm. latis; floribus paucis plerumque terminalibus deinde axillaribus, pedunculis fructiferis divergentibus; calycibus fructiferis 2–4 mm. longis; petalis nullis vel inconspicuis; capsulis maturis 3–4.5 (–5) mm. longis.

Stems flaccid, 0.3–4 dm. long: leaves lanceolate or lance-linear, uniform or nearly so; the primary 2.5–5.5 cm. long, 2.5–7 mm. wide: flowers few, mostly terminal, becoming axillary; the fruiting peduncles divergent; fruiting calyx 2–4 mm. long: petals none or inconspicuous: mature capsules 3–4.5 (–5) mm. long.— *S. borealis* of many American authors.— Wet places, Labrador to Alaska, south to Newfoundland, Magdalen Islands, Prince Edward Island, New England,

Pennsylvania, Michigan and Utah. A plant from open woods, Gap Mt., Troy, New Hampshire, 13 June, 1898 (*Rand & Robinson*, no. 459 in Gray Herb.) may be designated as the type specimen.

4. Var. **floribunda**, n. nom. *Spergulastrum lanceolatum* Michx. Fl. Bor.-Am. i. 275 (1803). *Micropetalon lanceolatum* Pers. Syn. i. 509 (1805). *Stellaria lanceolata* Torr. Fl. i. 453 (1824), not Poir. Encyc. vii. 416 (1806). *S. borealis*, var. *alpestris* Gray, Man. ed. 5, 93 (1867) as to *Robbins* plant but not *S. alpestris β.* Fries, Nov. Fl. Suec. Mant. i. 10 (1832) nor *S. alpestris* Fries (emend.) l. c. iii. 194 (1842). *Alsine borealis alpestris* Britton, Mem. Torr. Bot. Cl. v. 149 (1894), in part, not *S. alpestris* Fries. *S. borealis*, var. *corollina* Robinson, Proc. Am. Acad. xxix. 286 (1894), in part, not Fenzl in Ledeb. Fl. Ross. i. 382 (1842).— Wet or shaded places, Newfoundland to British Columbia, south to Nova Scotia, New England, New York, Michigan, Wisconsin, Minnesota and the mountains of Utah.

5. Var. **Bongardiana**, n. nom. *S. longifolia* Bongard, Vég. Sitch. 126 (1832), not Muhl. in Willd. Enum. 479 (1809). *S. borealis* of American authors, as to plant of the extreme West.— Wet or shaded places, Alaska to California; also eastern Quebec: Anticosti, *Pursh; Bic, F. F. Forbes.*

6. Var. **sitchana** (Steud.), n. comb. *S. brachypetala* Bong. Vég. Sitch. 126 (1832), not Bunge in Ledeb. Fl. Alt. ii. 161 (1830). *S. sitchana* Steud. Nom. ed. 2, ii. 637 (1841). *S. borealis*, var. *corollina* Gray, Proc. Am. Acad. viii. 378 (1872); Robinson, l. c. 286 (1894) as to western plant, not Fenzl l. c. (1842). *Alsine borealis alpestris* Britton in Britton & Brown, Ill. Fl. ii. 24 (1897), in part, not *S. alpestris* Fries, ll. cc. *A. brachypetala* Howell, Fl. N. W. Am. i. 82 (1897) in part (as to Bongard synonym).— Wet, shady places, Alaska to Oregon and Idaho.

Gray Herbarium.

A Pubescent Variety of the Dwarf Raspberry.— While recently working over a collection of plants from the Penobscot Bay region of Maine, a specimen of the Dwarf Raspberry *Rubus pubescens* Raf. (*R. triflorus* Richardson) was noted which differed from the usual form in the pubescence. The common plant has the leaves glabrous or slightly pilose on the veins beneath, while the plant from Penobscot Bay has the mature leaves densely pilose beneath. Further examination of material in the Gray Herbarium and the Herbarium of the New England Botanical Club showed this to be a well marked tendency occurring in several places, and it should therefore be recognized as a variety, and may be called

Rubus pubescens Raf., var. **pilosifolius**, n. var., foliis subtus dense pilosis.— Newfoundland: Channel, *Howe & Lang*, No. 907; Balena, Hermitage Bay, *Palmer*, No. 1352. Quebec: Basin Island, Magdalen Islands, *Fernald, Bartram, Long & St. John*, No. 7645. Maine: Brooklin, *A. F. Hill*, No. 1015 (type in Herb. New England Bot. Club). Massachusetts, Purgatory Swamp, Dedham. *C. E. Faxon*. Michigan: Keweenaw Co., *O. A. Farwell*, No. 182.— Albert F. Hill, Cambridge, Mass.

Kjellmannia sorifera found on the Rhode Island Coast.— A single specimen of the alga *Kjellmannia sorifera* Reinke was washed ashore at Bristol, Rhode Island, March 4th, 1901. It has been held until this time in the hope that the discovery of other specimens might throw further light upon the place of its growth. It was found after a storm, and is believed to have drifted from a locality further southward in Narragansett Bay. Since it is known only in the Southwest Baltic, and was not recognized there until 1888, its occurrence in our waters is a matter of surprise as well as congratulation. Whether, like various other brown forms, it came to us by currents from Greenland, is a problem reserved for the future. The thanks of the undersigned are tendered to Dr. W. G. Farlow and to Mr. Frank S. Collins, who have very courteously examined the specimens.— R. E. Schuh, Howard University, Washington, D. C.

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Maria L. Owen

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MARIA L. OWEN.

WALTER DEANE.

(With portrait.)

ANOTHER botanist long associated with the study of New England plants has passed away, and we mourn the loss of one always keenly devoted to her favorite pursuit and a painstaking student of the Nantucket flora. Those of us who were privileged to enjoy her warm friendship will always miss her kindly words and enthusiastic correspondence. Yet we must be grateful that this friend and fellow student reached a ripe old age and enjoyed to the last good health, while she made her valuable contributions on the New England flora.

Mrs. Maria L. Owen, as the botanical world always knew her, died in Plandome, Long Island, at the home of her daughter, Mrs. James Sullivan, on June 8, 1913, at the advanced age of eighty-eight years. She was born on the Island of Nantucket, Massachusetts, on February 13, 1825. Her full name was Maria Louise Tallant,[1] and she was the daughter of Eben Weld Tallant and Nancy Coffin. Through her father she was descended from Hugh Tallant, the early New England settler from Ireland, mentioned by Whittier in the "Sycamores," and from the prominent Weld family of Roxbury, Massachusetts. Through her mother she traced her descent from Tristram Coffin and others of the early settlers of Nantucket.

Through the maternal branch of her grandfather Coffin, Mrs. Owen

[1] Miss Helen A. Gardner writes me from Nantucket under date of August 1, 1914; "The only record of Mrs. Owen's full name is a copy of The Census of 1830. There it is given Maria Louise Tallant. Age 5 years." Mrs. Henry P. Tallant writes that Mrs. Owen always spelled her middle name Louisa.

was related to Benjamin Franklin and Daniel Webster and she related the following amusing story to the writer in a letter dated December 22, 1897. After saying that it was not necessary to thank her every time she sent a trifling specimen or botanical note she continued, "I recall my cousin (somewhat removed) Benjamin Franklin's suggestion to his father to ask a blessing over the whole barrel of pork instead of seeking it all winter long for the portions that appeared on the table,— an example that you can follow. The Doctor is not my own first cousin, because I live too late in the centuries, but two of my ancestors, one on my grandfather's side and the other on my grandmother's, stood in exactly that relation to him." Mrs. Owen had a keen sense of humor that constantly cropped out in her letters.

In regard to some of her ancestors she writes under date of November 17, 1895, "I am eligible to the same societies [Colonial Dames, etc.] on other grounds. Four pilgrim fathers and mothers, and back of them John Robinson, the Leyden pastor, ministers and elders in Boston and Salem of the very earliest settlers, and a very near relationship to Benj. Franklin are some of the qualifications I should put forth. I am content for the present, however, with being a Daughter of the American Revolution."

She attended the Nantucket "Coffin School," founded by Admiral Sir Isaac Coffin, her grandfather's cousin. It was a kind of high-school devoted to the classics and incidentally free to all members of the Coffin family, but a private school to all others. It was endowed by the Admiral and is still in existence, though its course of instruction has been changed. Mrs. Owen's grandfather Coffin was the first president of the trustees of the school. She also attended the private school of her uncle, Rev. Cyrus Pierce, and, in 1838, when the High School was opened, with him as principal, Maria Tallant was one of the thirty-five pupils.

Mrs. Owen's early life was passed in Nantucket and she seems to have always been fond of the flowers about her. Her aunt, Mrs. Pierce, was a good botanist, and it was natural that, surrounded by such influences the child should imbibe the taste for that science. Her mother and her sisters were all women of marked ability and of botanical tastes and the daughter Maria with her remarkable memory and scientific turn of mind went farther than her predecessors. Her interest never flagged throughout her long life. Her sister-in-law, Mrs. Henry P. Tallant of Philadelphia, very near and dear to Mrs.

Owen, writes, "Maria might very well have inherited a taste for outdoor life from old Hugh. He evidently was fond of trees for he planted the row of sycamores at his home in Haverill [Massachusetts], and all the Tallants I ever knew loved nature and were sportsmen and outdoors people. One cousin at Nantucket scoured the waters there for sea animals for an aquarium. The Tallants, also, had a quiet persistence, so that once started on a study they never gave it up, but would keep on in spite of all discouragements."

In regard to her strong constitution and freedom from those physical ailments that hamper the botanist who must be much afield, Mrs. Owen writes on March 28, 1905, "I owe my almost unbroken health to a grandmother and two grandfathers who lived in the same fortunate condition to the ages of 76, 79 and 86 respectively, and still more perhaps to the great-grandfather who lived to be 108, and in his old age could put his hands on the near horse of two standing side by side and leap over them both. To him also I doubtless owe largely the happy disposition and the elastic spirits that have come right up after many of the trials that seem to be appointed for all, for he

> "Delved by day and sang by night
> With a hand that never wearied,
> And a heart forever light,"

and passed through his long life

> "With [his] eyes brimful of laughter,
> And [his] mouth as full of song."

Owing so much to my forebears I am trying to be a good ancestress myself, and pass along the blessings I have received."

Her letters teem with deep devotion to her native home and are full of tender love for the flora of the island, and, though she left the spot at a comparatively early age, she never ceased to regard Nantucket as her true homé, and constant were the visits she made there to her dear island friends.

At one time Mrs. Owen taught in the school of George B. Emerson in Boston, and in 1845, 1846, and 1847 she was in South Boston teaching at the Perkins Institution for the Blind when Dr. Samuel G. Howe was superintendent. It was at the latter place that she met her future husband, Dr. Varillas L. Owen, who was Dr. Howe's secretary. Later she had a private school in Nantucket, which she left to become an assistant in the Nantucket High School.

On November 23, 1853, Maria Tallant was married in Nantucket to Dr. Owen and they went at once to Springfield, Massachusetts. Her life here of fifty years or more was one of continued activity. For years a Shakespeare Society met at her house and it was her delight to read and discuss the works of the great poet and other writers of note. During a portion of her life in Springfield, Mrs. Owen was actively engaged in teaching and I am glad to give the testimony of Miss Caroline Gray Soule of Brookline, Massachusetts, who was one of her pupils at that time. She says, "In the 'early seventies' Mrs. Owen taught botany and French in one private school in Springfield, and, two years later, astronomy and physical geography in another. She was a most interesting and inspiring teacher especially in botany, astronomy, and physical geography, which were to her all alive and active, not mere masses of scientific facts to be committed to memory.

"The growth and habits of a plant, its power of adaptation to environment, &c, were far more to her than the best mounted specimen, though she valued the herbarium for its practical uses.

"She knew how to ask questions, as well as to answer them, and to answer her questions satisfactorily to her was training in accuracy of observation, exactness of description, and use of English. No slipshod expression ever passed uncriticised, no careless observation or presentation of facts was left uncorrected in her class. She made her pupils really feel the scientific value of truth."

The Women's Club, founded in 1884, was another organization in which she was a prominent and efficient worker, its president, and later its honorary president. She writes on November 9, 1893, "From November through April our Women's Club takes much of my time; anything to be done for that takes precedence of almost everything else. I am president for the tenth year."

It is, however, of her botanical work that I shall speak especially. She was a ready writer and contributed many articles on botanical subjects to various papers, while the journal Rhodora occasionally received contributions from her pen. The Springfield Botanical Society, founded in 1876, owes its existence to Mrs. Owen and she has written a very bright account of its beginnings in the Thirtieth Annual Report of the Society, published April 19, 1907. After holding for many years the office of president, she retired from that onerous position and remained its honorary president till her death. Its members can testify to her zeal and efficiency in promoting its interests.

Whatever Mrs. Owen undertook she entered into with all her heart and she never failed to inspire those with whom she came into contact with some of her own enthusiasm. She was blessed with many friends, all ready and anxious to learn from her and to aid her in whatever way it was possible. And so she had many keen helpers in her various undertakings, and this was especially the case in her studies of the Nantucket flora, with which botanists in general, and especially those not personally acquainted with her will chiefly associate her; and indeed those of us who enjoyed a long acquaintance with her fully realize what a large share of her botanical activities the fair island claimed. A work on this subject had long been planned, and, for many years, she patiently and enthusiastically covered the island in her researches, referring all doubtful species to those in authority and enlisting under her banner those botanical friends who could visit the island and scour its moors and ponds for species new to her list, and venture into treacherous bogs where Mrs. Owen said she could not be expected to go. In this way many an added species was found and welcomed by her with her customary enthusiasm. To those who were privileged to enjoy a long and friendly correspondence with her it will always be a source of great gratification to recall the lively interest that each letter showed at a new discovery or extension of range. "Ecce Tillaea simplex!" was the way she began a letter on August 27, 1894, to the writer, when she announced the rediscovery of this choice plant in Nantucket three days before by Mrs. Mabel P. Robinson.[1] It had there remained hidden from botanists for sixty-five years, ever since William Oakes reported it in 1829.

Mrs. Owen's principal contributions to botany, outside of the various articles that have appeared in our journals from time to time, are two in number both relating to the island. The first is a "Catalogue of Plants growing without Cultivation on the Island of Nantucket" in Edward K. Godfrey's "The Island of Nantucket, its history, people, agriculture, botany, conchology and geology with maps to the town and island," published by Lee and Shepard in Boston in 1882. It is a small guide book of 365 pages and is extremely interesting, but we are especially concerned with the botanical part. This occupies pages 38 to 47 inclusive and consists of an introduction and a list. As the work is rare and scarcely known to many of the botanists of to-day,

[1] Botanical Gazette, xx, 80–81, 1895.

and as the introduction is of special interest, I venture to quote it in full. Mrs. Owen says, "At Mr. Godfrey's request, I have with much pleasure prepared the following catalogue. It is far from complete, being based upon collections made over thirty years ago, when I had made no study of the grasses and sedges, and when I had no thoughts of publishing. Still, in this imperfect form it will be of use to botanists, and the number of plants rare in New England which it contains, shows what pleasing discoveries are probably still to be made by exhaustive explorations.

"I hope to bring out, as soon as I have sufficient material, a more complete list to be published by itself, with such notes on the rarer plants as may be of interest. For this I ask the co-operation of all botanists, resident or visiting on the island, and I shall be extremely obliged for names and localities of additional species. To make the list more serviceable and authentic, it is desirable to have specimens of the new discoveries, for preservation in an herbarium of the island plants, which, if formed, will be freely accessible to botanists.

"Information is particularly desired about *Andromeda Mariana*, *Habenaria ciliaris*, and the *Tillaea*, *Calluna*, *Erica*, *Onosmodium*, *Mertensia*, *Ceratophyllum*, *Cypripedium*, and *Chara* of the catalogue. Some of these are represented so far by one single plant; and of others reported by older botanists, no one now living knows the locality.

"I am under obligations to several friends for help in this work, and must mention especially that I owe the list of algae to Mr. F. S. Collins, who drew it up from specimens principally collected by himself and Mr. L. L. Dame of Medford.

"The few miscellaneous cryptogams with which the list closes appeal to friendly specialists for re-enforcements; without such aid they will have to go into the next edition as lonely as they are now.

Maria L. Owen."

Then follows the Catalogue of Plants. They are listed in systematic order by their scientific names only, and without comments. There are just 500 species and varieties, and one form. This is certainly very creditable when we consider that the list was founded mainly on species collected before 1852 when Mrs. Owen was about twenty-five years old. It was the result chiefly of the enthusiastic study of plants in her younger days at a time when botanists and botanical centers where difficult species could be determined were fewer in number.

In 1888 appeared the work Mrs. Owen had so earnestly been preparing, "A Catalogue of Plants growing without cultivation in the County of Nantucket, Mass.," published in Northampton, Massachusetts, by the Gazette Printing Company. The six years that intervened between these two publications were busy ones. She enlisted many botanists to aid her in securing additions to her list and further information in regard to known species; she carried on a large correspondence; and she sent her doubtful species to proper authorities for accurate determination. It was the good fortune of the writer to witness much of this enthusiasm in his visits to the Island to aid the cause, in company with Judge J. R. Churchill of Dorchester, Massachusetts, and Rev. Dr. Thomas Morong of Ashland, Massachusetts. It is a work that reflects much credit upon its author and will always remain a true representation of the knowledge of the flora of the Island at that time.

The Catalogue contains a preface giving a description of the Island and of the botanical work done upon it and of the botanists who had aided her. The annotated list covers 75 pages, embracing 787 species and varieties, and one form, and includes a list of marine algae. This is an increase of nearly 300 over the 1882 list, while the notes accompanying the species lend added interest and information to the work. In this list Mrs. Owen was enabled to report *Onosmodium virginianum* and *Ceratophyllum demersum* from authentic specimens, discovered since the publication of the former list where the names were cited on the authority of President Hitchcock of Amherst fifty years before. It is to be regretted that Mrs. Owen did not make a complete herbarium of the plants represented in her list, but the species were verified always with great care, and the more uncommon ones were always preserved in some collections. She writes on January 15, 1887, that specimens scattered through herbaria are her authorities for the Flora. After its publication Mrs. Owen carefully kept track of the additional species that were discovered from time to time, the segregates that were made, the extensions of range, etc., and she always meant to publish these data, but advancing years compelled a relaxation in this pleasant but strenuous work.[1] Her botanical interests were broad and her trips to Europe and in her own neighborhood were enriched by her interest in the plants about her. Many a rarity she sent to her friends as the result of these excursions.

[1] The Flora of Nantucket is being published by Mr. E. P. Bicknell in the numbers of the Bulletin of the Torrey Botanical Club.

Dr. Owen died in 1897, but Mrs. Owen continued to reside in Springfield till 1907 when she moved to the home of her daughter in Plandome, Long Island. Here she lived till her death. It was the fading away of a happy old age, and the end came on a bright morning with the room flooded with sunshine, which she always loved, and filled with iris, columbine and corn flowers. She was a woman of strong faith and she lived true to the motto of her mother's family, "Post tenebris speramus lumen de lumine," which she loved to translate, "After the darkness we hope for light from the *source* of light."

Mrs. Owen had two children, Walter L. Owen, architect, deceased, and Amelia, wife of Dr. James Sullivan, who survives her.

In preparing this paper I wish to acknowledge the kind assistance of Mr. F. Schuyler Mathews of Cambridge, Massachusetts, Miss Caroline G. Soule of Brookline, Massachusetts, and Mrs. Henry P. Tallant of Philadelphia. Acknowledgments are also extended to the Springfield Botanical Society and the Springfield Art Museum for the loan of the plate for the portrait accompanying this article.

Cambridge, Massachusetts.

THE VARIATIONS OF RANUNCULUS CYMBALARIA.

M. L. Fernald.

Ranunculus Cymbalaria Pursh, originally described from the saline marshes of Onondaga Lake, New York, is found in saline habitats in the northern or cooler areas of North America and Asia. In America it extends southward along the coasts to New Jersey and California and through the interior to western New York, Illinois, Texas and central Mexico; and it reappears in South America on the high Andes from Ecuador to Argentina (*R. tridentatus*, var. *minor* HBK.).

Throughout the greater portion of its range the species seems to be essentially uniform: a fleshy, strictly glabrous plant with small flowers (6–9 mm. broad) having the subequal sepals and petals 2–4 mm. long; the stamens in one or two rows and with subglobose anthers; and the head of young carpels 1.5–5 mm. high during anthesis (before the falling of the last petals and stamens). In this plant, which is the characteristic coastwise and northern form of the spe-

cies, the fruiting head is very variable in length (2.5–13 mm.) and the strongly ribbed achenes are prominently beaked and ordinarily almost stipitate.

In the more arid region of the Rocky Mountains and the Great Basin, however,— from Assiniboia, Montana and Idaho south to south-central Mexico and west into Washington, Oregon and California — the plant ordinarily has heavier foliage and larger flowers (1–2 cm. broad) and departs in a number of less conspicuous tendencies from true *R. Cymbalaria* of our more humid regions. In this large-flowered Rocky Mountain extreme the young petioles or the peduncles are often pilose; the sepals and petals are 4–9 mm. long, the stamens commonly in 3–5 rows and with slightly elongate anthers; the head of young carpels is more elongate than in *R. Cymbalaria*, 3.5–11 mm. long in anthesis, but the fruiting head is less variable in length, 7–12 mm. long; and the achenes are usually paler in color, less strongly ribbed than in *R. Cymbalaria* and with less prominent beaks and broader bases.

These characters, though clearly marking in their aggregate the large-flowered plant as different from the small-flowered type, are all variable and it does not seem possible to separate the plant specifically from *Ranunculus Cymbalaria*; but as a pronounced geographic variety it seems worthy of recognition. The plant is *R. tridentatus* HBK., var. *major* [*us*] HBK.[1] *R. tridentatus* was defined as consisting of two varieties. The first, α *minor*, with "Flores erecti, magnitudine *R. arvensis*," coming from "*prope Lactacunga Quitensium* (*alt.* 1490 *hex.*), *inter saxa punicea*," as shown by several sheets from the Andes, is scarcely separable from *R. Cymbalaria* and it is so treated by R. E. Fries in his contribution *Zur Kenntniss der alpinen Flora im nördlichen Argentinien*. The second variety, β *major*, with "Flores erecti, magnitudine floris *R. Flammulae*" and coming from "*prope Carpio Mexicanorum, ad lacum S. Christobal, alt.* 1180 *hex.*," is well represented by material from the Federal District of Mexico, Durango, San Luis Potosi and Coahuila, and is the large-flowered plant of our Rocky Mountain district. In view of the publication of *R. Cymbalaria*, var. *major* Hook. f. & Thomson [2] from Tibet it is undesirable to create confusion by transferring to *R. Cymbalaria* the earlier *R. tridentatus*, var. *major* HBK.; so that another name for the latter plant is proposed.

[1] HBK., Nov. Gen. et Sp. Pl. v, 42 (1821).
[2] Hook. f. & Thomson, Fl. Ind. i, 30 (1855).

Another variant of *Ranunculus Cymbalaria* which does not seem to have been recognized is the pubescent extreme of the small-flowered plant. In all accounts, *R. Cymbalaria* is described as glabrous, and in the more saline habitats it certainly is so; but in the interior regions it is quite as often pilose on the petioles or peduncles and this pubescent form is sometimes found on fresh soils near the coast.

The smallest extreme of the glabrous *Ranunculus Cymbalaria*, Hooker's var. *alpinus*,[1] "minor, foliis apice tridentatis, scapo unifloro" seems to be merely a dwarfed extreme such as can be found in unfavorable habitats nearly throughout the range.

The two noteworthy variants above discussed may be called

RANUNCULUS CYMBALARIA Pursh, forma **hebecaulis**, n. f., petiolis pedunculisque plus minusve pilosis; floribus 6–9 mm. latis.— In apparently less alkaline habitats than the glabrous plant. QUEBEC: moist hollows in gravelly beach, Carleton, July 21, 1904, *Collins & Fernald*. PRINCE EDWARD ISLAND: wet mossy spots with *Eriophorum angustifolium*, *Smilacina trifolia*, etc., near Cape Wolf, July 3, 1914, *Fernald & St. John*. HUDSON BAY REGION: *Burke*. ONTARIO: shore of Georgian Bay, Collingwood, August 28, 1908, *N. Tripp*. MINNESOTA: Willmar, Kandiyohi Co., July, 1892, *W. D. Frost*. NORTH DAKOTA: wet prairies, Leeds, June 6 and July 10, 1898, *J. Lunell*. KANSAS: Syracuse, Hamilton Co., alt. 3500 ft., July 13, 1893, *C. H. Thompson*, no. 108. TEXAS: along waters, Canyon, August 7, 1903, *J. Reverchon*, no. 3702. MANITOBA: Lake Winnipeg Valley, 1857, *Bourgeau*. ALBERTA: Banff, alt. 4500 ft., June 11, 1906, *Butters & Rosendahl*, no. 1339 (TYPE in Gray Herb.). IDAHO: around springs, alt. 3500 ft., Squaw Butte, Boise Co., August 18, 1911, *J. A. Clark*, no. 268.

R. CYMBALARIA, var. **saximontanus**, n. nom. *R. tridentatus* HBK., var. *major* HBK., Nov. Gen. et Sp. Pl. v. 42 (1821), not *R. Cymbalaria*, var. *major* Hook. f. & Thomson, Fl. Ind. i. 30 (1855). Very fleshy, rather large: petioles and peduncles more or less pilose: blades orbicular, ovate or oblong, 1–3.5 cm. long: peduncles 3–20 cm. long, 1–6-flowered, usually pilose: flower 1–2 cm. broad: sepals and petals 4–9 mm. long: stamens commonly in 3–5 rows; anthers ellipsoid: head of young carpels 3.5–11 mm. long in anthesis; fruiting head 7–12 mm. long: achenes mostly pale, faintly or prominently ribbed, commonly rounded at base.— Arid districts of the Rocky Mountain region from Saskatchewan to south-central Mexico, west into Washington, Oregon and California.— SASKATCHEWAN: *Bourgeau*. MONTANA: West Gallatin River, June 9, 1883, *Scribner*, no. 4a; Brick Glade, Belgrade, May 31, 1901, *E. J. Moore*. WYOMING: wet flats, Laramie, July 19, 1900, *A. Nelson*, no. 7629; wet places about the springs, Mammoth Hot Springs,

[1] Hook. Fl. Bor.-Am. i. 11 (1829).

July 4, 1899, *A. & E. Nelson*, no. 5663. COLORADO: moist ground near river, Fort Collins, May 15, 1894, *Crandall*, no. 22; Aboles, June, 1899, *C. F. Baker*, no. 328. NEW MEXICO: near Espanola, May 17, 1897, *Heller*, no. 3544; Kingston, May 19, 1905, *Metcalfe*, no. 1601; Mangas Springs, June 11, 1903, *Metcalfe*, no. 128. IDAHO: wet banks, Payette, *Macbride*, no. 869; loamy slopes, Boulder Creek, July 31, 1910, *Macbride*, no. 503; moist banks, New Plymouth, June 15, 1910, *Macbride*, no. 246. UTAH: Wahsatch Mts., May, 1869, *Watson*, no. 20; Modena, June 2, 1902, *Goodding*, no. 1011; Salt Lake City, June, 1904, *A. O. Garrett*. NEVADA: Carson City, *A. Gray;* Soda Lake, August, 1867, *Watson*, no. 20. ARIZONA: river bottom, Boyles, *Goodding*, no. 516. COAHUILA: Saltillo, May, 1898, *Palmer*, no. 178. SAN LUIS POTOSI: region of San Luis Potosi, 1878, *Parry & Palmer*, no. 3. DURANGO: Durango, 1896, *Palmer*, no. 96. MEXICO: near Mexico, May 15, 1865-66, *Bourgeau*, no. 2. CALIFORNIA: Bear Valley, San Bernardino Mts., June, 1886, *Parish*, no. 1788; Silver Canyon east of Laws, May 9, 1906, *Heller*, no. 8213. OREGON: near Mitchell, May 15, 1885, *Howell*, no. 322. WASHINGTON: near Sprague, Lincoln Co., June 3, 1893, *Sandberg & Leiberg*, no. 135; Rattlesnake Mts., June 15, 1901, *Cotton*, no. 414.

GRAY HERBARIUM.

NEW ENGLAND DISTRIBUTION OF ILEX OPACA AND ILEX GLABRA.

CLARENCE H. KNOWLTON.

IN travelling over southeastern Massachusetts by winter and summer, I have been much interested in the detailed distribution of the two evergreen *Ilices*, *Ilex opaca* and *I. glabra*, which somehow seem quite exotic among our other New England plants. These two species, along with *Chamaedaphne*, the Kalmias, and the isolated *Rhododendron maximum*, are our only conspicuous broad-leaved evergreens.

According to Robinson's Flora of Essex County there were a few scattered trees of *Ilex opaca* on Cape Ann at Rockport, but these have been extinct since 1880, according to J. H. Sears, RHODORA x. 43. This is an isolated station, however, for the general range of the species is from Quincy, Holbrook, Hingham and Cohasset south to

Buzzard's Bay, Naushon Island, Dartmouth and Westport with Bridgewater, Taunton, Somerset and Swansea for inland limits. In some of the towns in this area it is abundant and fruits heavily; in others there are only scattering, badly-hacked trees with sterile flowers. The best trees I have seen are in Marion and Mattapoisett, the largest about 2.5 dm. in diameter.

On Cape Cod it is known at Bourne (Cataumet), Sandwich and Barnstable. I came across the last station, near Centreville, last summer, and it contains about forty trees of various sizes, in rather dry woods. Below this place it is not recorded, and on the lower Cape, according to Messrs. F. S. Collins and W. P. Rich, it is not to be found. In this connection it is interesting to know that according to Mourt's Relation the Pilgrims found the holly growing in the open woods at Provincetown when they first landed, Nov. 11, 1620, and later on Dec. 18 at Plymouth, where it is still known. It is also found as a rare plant on Nantucket. Removal of the woods and frequent fires, as well as the desire for Christmas greens have doubtless contributed to its disappearance.

In Rhode Island the holly is abundant at Tiverton, and occurs also at Little Compton, Prudence and Conanicut Islands, South Scituate, Coventry, and North and South Kingston, all in the southern third of the State.

In Connecticut the species is decidedly rare, according to the State Flora, (1910) occurring only in Waterford, Milford and Wolcott. The authors say: "Escaped from cultivation or possibly native."

The range of *Ilex glabra* is very similar. At Magnolia swamp in Gloucester, there is a very vigorous colony of it, growing with *Smilacina trifolia* and covering a considerable area. It is also reported from Wenham and Rockport. Its next appearances are at the Blue Hills, Hingham and Cohasset, thence southward to Buzzard's Bay and Nantucket in the same area as *Ilex opaca*, but much more abundant. It is decidedly abundant on Cape Cod, where it has escaped fires because of its swampy habitat, and it flourishes even in Provincetown. In Middleboro and Marion I have seen bushes 1.5 m. in height, but it is usually much smaller.

In Rhode Island it is reported from Tiverton and from four stations in Washington county. In Connecticut there are four stations in New London county, and one at Guilford, some thirty miles to the west,

I have found no records from Martha's Vineyard for either species, and they are not known on Block Island.

For *Ilex opaca* this area forms the extreme northeastern limit of the species, which follows the coastal plain south to Florida, and extends inland to Missouri. It prefers moist soil in woods, but is also frequent southward on dry mountain slopes.

Ilex glabra finds its extreme northeastern limit in southwestern Nova Scotia growing in the southern counties as far east as Halifax,[1] but there is a gap of 275 miles between there and Cape Ann, with no intervening stations. It follows the coast southward in swamps, moist sand, and low woods, to Florida and Louisiana.

It is very interesting that these two allied species, with somewhat different soil-preferences, should be so evenly distributed over the same area in southeastern New England. Along with them here and there are over a hundred other coastal-plain plants, many of which find their northeastern limits here. The waterwashed glacial debris found in these New England sand-plains and kames is sufficiently like the recent coastal-plain further south, to furnish similar soil conditions, while further north on the New England coast these conditions disappear, and the plants with them.

For information in regard to these ranges I am indebted to Dr. E. W. Sinnott, Messrs. A. C. Bent, S. N. F. Sanford and Professors J. F. Collins and M. L. Fernald.

HINGHAM, MASSACHUSETTS.

THE WEST VIRGINIAN VARIETY OF POLYGONUM CILINODE.— *Polygonum cilinode* Michx., one of the commonest plants of the Canadian Zone, ranges from Newfoundland to Athabasca and south into the Great Lake states, the mountains of Pennsylvania, and the cooler districts of New England. South of the Pennsylvania mountains it is very rare, but it has been reported as far south as North Carolina. The only material seen by the writer, however, from south of Pennsylvania is Greenman's No. 346 from Spruce Knob, West Virginia, where the plant is localized, as indicated by the citation in Millspaugh's *Living Flora of West Virginia* (1913) of no other station in the state. But besides its isolation on Spruce Knob, the West Virginian

[1] Macoun, Cat. Can. Pl. pt. 3, 503; Proc. & Trans. N. S. Inst. Sci. viii. 107.

plant has other points of interest. Throughout its continuous range in British America and the northern states *P. cilinode* has the stems always puberulent and the lower surfaces of the leaves densely pilose; but the Spruce Knob plant has its stems and leaves quite glabrous, or the leaves rarely with a very sparse pubescence on the veins beneath. The fruiting calyx is slightly shorter than is common in the northern typical form, 3.5–4 mm. long; in the northern plant ordinarily 4–5 mm. long. And the achenes of the Spruce Knob plant are broadly trigonous-obovoid or -subglobose and scarcely 3 mm. long; in the northern pubescent plant usually more ellipsoid and from 3–4 mm. long.

These characters, if constant, would indicate that the Spruce Knob plant is specifically distinct; but an examination of 86 sheets of true *Polygonum cilinode* shows that the pubescent plant sometimes has the calyx and the achene quite as short and plump as in the West Virginian material. It seems wisest, then, to designate the southern plant as

POLYGONUM CILINODE Michx., var. **laevigatum**, n. var., caule glabro; foliis glabris vel subtus sparse pilosis: achaeniis late trigonis obovoideis vel -subglobosis vix 3 mm. longis — WEST VIRGINIA: Spruce Knob, 14 September, 1904, *J. M. Greenman*, no. 346 (TYPE in Gray Herb.).— M. L. FERNALD, Gray Herbarium.

AN UNWELCOME INVADER.— Another species of the weedy annual brome grasses has entered the Manual region. This is *Bromus villosus* Forsk. (*B. maximus* Desf.) which has appeared along the railway at College Park, Maryland. Specimens were brought to the National Herbarium by Mr. S. D. Gray in early June, and more sent later by Professor J. B. S. Norton. This is one of the group of Mediterranean species that today cover the overgrazed slopes and valleys of southern California, often in favorable situations growing as thickly as a field of grain. *Bromus villosus* and its variety *Gussonei* Aschers. & Graebn. like their allies, *B. madritensis* L. and *B. rubens* L., are injurious to grazing animals, the long scabrous awns of the ripened florets, scattered by the wind over the pastures, penetrating the tender parts of the nose and mouth, often causing sores. If this species spreads as rapidly in the eastern states as has its comparatively inoffensive little relative *B. tectorum* it will probably soon be one of our worst annual weeds.— AGNES CHASE, Department of Agriculture.

The glabrous-leaved Sweet Gale.— In his *Monographie des Myricacées* Dr. Auguste Chevalier treats the Sweet Gale, *Myrica Gale* L. as a distinct genus *Gale* and divides the circumpolar *G. palustris* (Lam.) Chevalier into many varieties, six of which he credits to North America. Most of the varieties seem to be of minor importance, based upon the toothing of leaves and slight variations of pubescence, but one, his var. *subglabra* is better distinguished and has a well defined geographic range. In typical *Myrica Gale* the leaves are more or less pubescent, at least on the veins beneath. This shrub, with pubescent leaves, is rather generally distributed in the cooler regions of Eurasia and North America. The most pronounced departure from it is the strictly North American

Myrica Gale L., var. **subglabra** (Chevalier), n. comb. *Gale palustris*, var. *subglabra* Chevalier, Mon. Myric. 185 [reprint, 101] (1901). Leaves glabrous or glabrate throughout.

Chevalier cites only four stations: in Labrador, Newfoundland, Quebec and Maine; but var. *subglabra* is widely distributed from Labrador to Lake Huron, south to New Jersey and Pennsylvania, in some areas apparently quite replacing the more widely distributed pubescent-leaved shrub.— M. L. Fernald, Gray Herbarium.

Panicum wrightianum in Long Island.— After the publication of the revision of Panicum by Hitchcock & Chase (Contr. U. S. Nat. Herb. Vol. 15. 1910) we found the name *Panicum deminutivum* Peck (Bull. N. Y. State Mus. 116. Bot. Vol. **10**: 27. 1907) had been overlooked. Through the kindness of Dr. H. D. House, Assistant State Botanist of New York, we have received a portion of the type specimen. It proves to be *Panicum wrightianum* Scribn. The specimen was collected by Professor C. H. Peck, Wading River ("Little Pond"), N. Y. This Long Island station is the only one known in New York for this species. It was found in Barnstable, Massachusetts in 1910 by C. H. Knowlton and in 1911 by E. W. Sinnott.— Agnes Chase, Bureau of Plant Industry, Washington, D. C.

Station for fruiting Euphorbia Cyparissias.— On the west shore of New Haven Harbor, but within the borders of West Haven, is an extensive station where *Euphorbia Cyparissias* fruits freely.

The species grows in colonies on a slightly elevated sandy plain, over an area which I should estimate to be more than twenty-five acres. These colonies are very numerous and some of them are quite large. On June 9, 1914, practically all the colonies were loaded with fruit. I collected from this station in 1903 but the specimens were destroyed by accident a few years later. Plants collected in June, 1914, have been deposited in the Gray Herbarium. The West Haven Station, reported by Mr. A. E. Blewitt (Rhodora **15**:43), is apparently distinct from the present station, as extensive salt marshes, and a level tract on which the species does not occur in noticeable quantity, intervene between the two stations.— R. W. Woodward, New Haven, Connecticut.

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SOME WILLOWS OF BOREAL AMERICA.

M. L. Fernald.

The genus *Salix*, as it occurs in the "Manual region" of the eastern United States and adjacent Canada, is well understood and its species within this range are comparatively few in number. Farther to the northeast, however, in the calcareous and magnesian districts bordering on the lower St. Lawrence and the cold northern half of the Gulf, i. e., the region embracing the Gaspé Peninsula, Anticosti, the Mingan Islands, western Newfoundland and southeastern Labrador, the genus is very largely developed and we are only beginning to realize the great number of peculiar species which characterize this area. Several of them,— *S. fuscescens* Anderss., *S. desertorum* Richardson, *S. calcicola* Fernald & Wiegand, *S. vestita* Pursh, and *S. reticularis* L.— are of wider northern range; but some others,— *S. obtusata* Fernald, *S. latiuscula* Anderss., *S. laurentiana* Fernald and *S. chlorolepis* Fernald — are apparently endemic to the region. These, however, represent only a minor portion of the willow-species of the area. Every season of active field-work adds to the number, and we now know from the district nearly forty species, twenty well-defined varieties, and numerous hybrids of *Salix*. When the vastness and diversity of the region is considered, together with the fact that only a few scattered localities have been visited by a botanist (and at many of these no willows have been collected), it is evident that scarcely more than a beginning has been made in bringing together from the region a representative collection of the willows. The species of certain sections of the genus still await detailed study, but in attempting to settle the identity of the species belonging in other sections it has been found necessary to

characterize some as new. Certain others, as yet known only from foliage-specimens, seem to be unique; but these are naturally reserved for further study when flowering or fruiting material has been secured.

Salix myrtillifolia Anderss. The complex of British American and Rocky Mountain shrubs passing as *S. novae-angliae* Anderss. or as *S. pseudo-myrsinites* Anderss. is at present inadequately represented in herbaria, but, if one may judge from the material now available, they all belong to one general specific type. It is hardly correct, however, to use for the species, as we have recently done, the name *S. pseudo-myrsinites* or, as was done a generation ago, the name *S. novae-angliae.* Andersson, who described numerous minor variants of this group, named and renamed the same shrubs in a perplexing fashion. The first publication of any distinctive names for these northern shrubs was by Andersson, who, in 1858 (Öfvers. af K. Vet.-Akad. Förh. Årg. 15. No. 3, pp. 129, 130) credited the Old World *S. myrsinites* with two American subspecies: *S. myrsinites,* 1. *S. pseudo-myrsinites* Andersson, "*Hab.* 'on the grand rapid of Sascatchavan, et in 'Rocky mountains';" and *S. myrsinites,* 2. *S. curtiflora* Andersson, "*Hab.* 'Fort Franklin, Mackenzieriver, *Richardson*';" while on a succeeding page (132) he published the closely related *S. myrtillifolia* as a fully ranking new species from "Rocky mountains, east side, low situations."

Of these three plants there is in the Gray Herbarium a cotype of *S. myrsinites,* 1. *S. pseudo-myrsinites,* labeled by Andersson himself and closely agreeing with the original description in having the conic-subulate capsules pedicelled (the mature pedicels nearly equaling or slightly exceeding the pale brown scales). This authentic material is well matched by fruiting specimens from the eastern watershed of the continent — such plants as Fernald & Wiegand's no. 3161 from Blanc Sablon, Labrador; material collected by Macoun on July 30, 1869, on Pic River, Ontario; and M. A. Barber's no. 281 from alt. 6000 ft., Banff, Alberta; but many of the foliage-specimens referred to *S. pseudo-myrsinites* and all the material so-called from west of the Rocky Mountain system seem to be different. Of the other two plants, *S. myrsinites,* 2. *S. curtiflora* and *S. myrtillifolia,* only unverified and inadequate material has been seen, although in the Gray Herbarium there is a fragmentary specimen collected by Richardson at Fort Franklin and seemingly a cotype of *S. myrsinites,* 2. *S. curtiflora,* but labeled by Andersson *S. myrtillifolia.*

In his later publications, his *Monographia Salicum* and his treatment

of the genus in De Candolle's *Prodromus,* Andersson threw all three together as one species distinct from *S. myrsinites* and rechristened *S. novae-angliae* "*Hab.* in America septentrionali ad fl. Saskatchavan, et in Montibus petrosis summis." [1] As treated in the *Monographia, S. novae-angliae* consisted of three subspecies: *S. novae-angliae,* 1. *S. pseudo-myrsinites,* based on the former *S. myrsinites,* 1. *S. pseudo-myrsinites,* and made in the *Monographia* to consist of three defined forms; *S. novae-angliae,* 2. *S. pseudo-cordata,* based on the earlier *S. myrsinites,* 2. *S. curtiflora*; and *S. novae-angliae,* 3. *S. myrtillifolia,* based upon the older species, *S. myrtillifolia.* In DeCandolle's *Prodromus,* however, with the title-page indicating publication earlier than the *Monographia* but containing exact page-citations of the latter work and consequently of presumably later date, *S. novae-angliae* (from "America boreali anglica," [2] etc.) is kept up and the numbered subspecies of the Monograph are treated as varieties (designated, according to the instructions of the DeCandollean code, by Greek letters); *S. novae-angliae,* α, *pseudo-myrsinites,* β, *pseudo-cordata,* and γ, *myrtillifolia.*

All this, of course, is very perplexing, but it is evident that in his mature judgment Andersson considered all three shrubs as belonging to one North American species. The material which seems to belong in these three categories is certainly too difficult of separation, and after prolonged study the writer is satisfied to accept the conclusion of Andersson, and later of Bebb, that they are all one species. Furthermore, there can be no question that Bebb's further conclusion is correct, that for the species "S. myrtillifolia is the oldest (and best) name";[3] for *S. myrtillifolia* was published as a true species in 1858, six years before the publication of *S. novae-angliae,* while the name *S. pseudo-myrsinites,* though of binomial form, was published and intended by Andersson not as the name of a fully ranking species but of a subspecies, and later of a variety.

Throughout its range, from southern Labrador, northern Newfoundland and the Gaspé Peninsula to the northern Rocky Mountains, *S. myrtillifolia* is fairly constant in having the foliage green on both surfaces or merely a little paler beneath and in having the more or less pediceled capsules slenderly conic-subulate and subtended by brownish

[1] Anderss. Mon. Sal. 160 (1865?).
[2] Anderss. in DC. Prodr. xvi. pt. 2, 253 (1864).
[3] Bebb, Bot. Gaz. xv. 54 (1890).

or fuscous scales. On mossy knolls of the limestone tableland of Table Mountain on Port à Port Bay in western Newfoundland, a low shrub closely agreeing with *S. myrtillifolia* in foliage, aments, etc., departs from the general tendencies of the species in having the foliage conspicuously whitened beneath, the scales of the ament black, and the capsules sessile or subsessile and of a conic-ovoid outline. These characters would, at first sight, seem to constitute a good species, but in the series of specimens of *S. myrtillifolia* from across the continent one or another of these exceptional characters occasionally appears in otherwise good *S. myrtillifolia* and it is, therefore, most satisfactory to treat the Table Mountain shrub as a very extreme variety of a widely distributed species. It may be called

S. myrtillifolia Anderss., var. **brachypoda**, n. var., frutex caespitosus trunco subterraneo prostrato usque 1 cm. diametro, ramis assurgentibus 1–3 dm. altis, cortice brunneo, ramulis puberulis; foliis oblongis vel obovato-oblongis obtusiusculis crebre crenatis 1–3.5 cm. longis 0.4–1.6 cm. latis utrinque glaberrimis planis supra viridibus lucidis reticulato-venosis subtus glauco-albescentibus exsiccatione nigrescentibus, petiolis 1–2 mm. longis; stipulis nullis; amentis fructiferis 1.5–2.5 cm. longis 0.8–1 cm. crassis foliis parvis 1–3 suffultis, pedunculo rhachique albo-villosis; squamis atris oblongis obtusis villosis vel glabratis 1–1.5 mm. longis; capsulis conico-ovoideis glabris fulvescentibus 4–6 mm. longis subsessilibus, stylo 0.5–1 mm. longo, stigmatibus brevibus divergentibus, nectario minuto.

Caespitose shrub with subterranean prostrate trunk up to 1 cm. in diameter; branches assurgent, 1–3 dm. high, with brown bark; the branchlets puberulent: leaves oblong or obovate-oblong, obtusish, closely crenate, 1–3.5 cm. long, 0.4–1.6 cm. wide, glabrous on both surfaces, flat, the upper surface green, shining and reticulate-veined, the lower glaucous-whitened, quickly blackening in drying, petioles 1–2 mm. long: stipules none: fruiting aments 1.5–2.5 cm. long, 0.8–1 cm. thick, subtended by 1–3 small leaves; peduncle and rhachis white-villous: scales black, oblong, obtuse, villous or glabrate, 1–1.5 mm. long: capsules conic-ovoid, glabrous, reddish-yellow, 4–6 mm. long, subsessile; style 0.5–1 mm. long; stigmas entire, divergent; nectary minute.— Newfoundland: mossy knolls on the limestone tableland, altitude 200–300 m., Table Mountain, Port à Port Bay, July 17, 1914, *Fernald & St. John*, no. 10,822 (type in Gray Herb.).

Salix **cryptodonta**, n. sp., frutex 3–4 m. altus, ramis fuscis lucidis, ramulis tenuibus albido-tomentosis; foliis crassiusculis utrinque subrugosis oblongo-lanceolatis 3–5 cm. longis 1–2 cm. latis acuminatis basi rotundatis margine revolutis adpresse vel obscure crenatis,

dentibus glanduligeris, supra viridibus opacis plus minusve tomentulosis subtus cinereo-tomentosis, petiolis tomentosis 2–4 mm. longis; stipulis semi-ovatis vel lanceolatis glanduloso-serratis; amentis fructiferis pedunculatis crasse cylindricis 2–2.7 cm. longis 1.3–1.5 cm. crassis densifloris, pedunculo foliis instructo; squamis fulvis lineari-oblongis 3 mm. longis apice pilosis, pilis 1–1.5 mm. longis; capsulis conico-subulatis 8–10 mm. longis cinereo-tomentosis, stylo vix 1 mm. longo, stigmatibus bifidis divergentibus, pedicello nectarium multo superante quam squama vix breviori.

Shrub 3–4 m. high; branches fuscous, shining; branchlets slender, white-tomentose: leaves thickish, somewhat rugose on both sides, oblong-lanceolate, 3–5 cm. long, 1–2 cm. wide, acuminate, rounded at base; margin revolute, appressed-crenate, the teeth gland-tipped; upper surface green, opaque and more or less tomentulose; lower surface ashy-tomentose; petioles tomentose, 2–4 mm. long: stipules semi-ovate or lanceolate, glandular-serrate: fruiting aments peduncled: thick-cylindric, 2–2.7 cm. long, 1.3–1.5 cm. thick, densely flowered; the peduncle leafy: scales reddish-yellow, linear-oblong, 3 mm. long, the apex pilose with hairs 1–1.5 mm. long: capsules conic-subulate, 8–10 mm. long, ashy-tomentose; style barely 1 mm. long; stigmas bifid, divergent; pedicel much longer than the nectary and barely shorter than the scale.— Newfoundland: by rapids below Seal Pond, Birchy Pond Stream, East Branch of the Humber, July 14, 1910, *Fernald & Wiegand*, no. 4264.

Nearest related, apparently, to *S. californica* Bebb, but with shorter aments, paler and narrower scales, longer capsules, much longer pedicels, and the more tomentose leaves with less numerous glandular teeth. Slightly suggesting *S. candida* Flügge but with more slender branches, more rugose and shorter leaves with looser and less whitened tomentum, gland-tipped teeth, longer pale scales, and longer capsules and pedicels.

Salix **glaucophylloides**, n. sp., frutex mediocris vel altus vel arbor humilis usque 5 m. altus; ramulis glabris vel griseo-puberulis glabratisque, pilo rare persistente, cortice plus minusve castaneo; foliis oblongis vel lanceolatis, maturis subcoriaceis 3.5–12 cm. longis 1.5–6 cm. latis apice acutis vel subacutis basi cordatis vel rotundatis vel angustatis utrinque glaberrimis planis supra viridibus sublucidis subtus glauco-albescentibus exsiccatione nigrescentibus margine crebre crenatis vel crenato-serratis, serraturis glanduligeris, petiolis 3–12 mm. longis; stipulis semicordatis argute serratis plerumque persistentibus; amentis fructiferis 2–4 (–5) cm. longis 1–1.5 cm. crassis foliis parvis 3–5 suffultis; pedunculo rhachique albido-piloso, pilis minutis; squamis brunneis vel fuscis obovatis vel oblongis obtusis 1.5–2 mm. longis albido-pilosis, pilis 1.5–2.5 mm. longis; capsulis conico-subulatis rostratis glabris 4–7 mm. longis basi cordatis, stylo

tenue 1–1.5 mm. longo, stigmatibus adscendentibus brevibus bifidis, pedicello nectarium duplo–triplo superante quam squama breviori.

Medium-sized or large shrub or small tree up to 5 m. high; branches glabrous or grayish-puberulent and finally glabrate, the pubescence rarely persistent; cortex more or less castaneous: leaves oblong or lanceolate, the mature subcoriaceous, 3.5–12 cm. long, 1.5–6 cm. wide, acute or subacute, cordate, rounded or rarely narrowed at base; glabrous on both surfaces, plane, green and somewhat lustrous above, glaucous-whitened beneath, blackening in drying, the margin closely crenate or crenate-serrate with gland-tipped teeth; petioles 3–12 mm. long: stipules semi-cordate, coarsely serrate, usually persistent: fruiting aments 2–4 (–5) cm. long, 1–1.5 cm. thick, subtended by 3–5 small leaves: peduncle and rhachis white-pilose with minute hairs: scales brown or fuscous, obovate or oblong, obtuse, 1.5–2 mm. long, white-pilose with hairs 1.5–2.5 mm. long: capsules conic-subulate, beaked, glabrous, 4–7 mm. long, cordate at base; style slender, 1–1.5 mm. long; stigmas ascending, short, bifid; pedicel 2–3 times as long as the nectary and shorter than the scale.— Alluvial shores and calcareous slopes, Newfoundland, Quebec, New Brunswick and Maine. Newfoundland: banks of Humber River between Mt. Musgrave and Humber Mouth, July 15, 1910, *Fernald, Wiegand & Kittredge*, no. 3153; gravelly thickets along Harry's River, August 18, 1910, *Fernald & Wiegand*, nos. 3154 & 3155 (twigs pubescent), 3156 (mature leaves lanceolate, narrowed at base; leaves of sucker-shoots ovate-oblong, cordate); near the gypsum quarry at mouth of Romain's Brook, Bay St. George, August 15, 1910, *Fernald, Wiegand & Kittredge*, no. 3157 (trees); damp bushy ravines and brooksides in the limestone tableland, Table Mountain, Port à Port Bay, August 16, 1910, *Fernald, Wiegand & Kittredge*, nos. 3158, 3159, July 16 & 17, 1914, *Fernald & St. John*, nos. 10,819 (type in Gray Herb.), 10,820, 10,821. Quebec: gravel beaches near the mouth of Dartmouth River, August 26 & 27, 1904, *Collins, Fernald & Pease;* banks of the Grand River (Gaspé Co.), June 30–July 3, 1904 (several leaf-variants), *Fernald;* alluvial soil, mouth of Port Daniel River, July 30, 1902, *Williams & Fernald;* gravelly beaches and flats of Bonaventure River, July 5, 6 & 8, 1904, *Collins, Fernald & Pease;* Arbor Vitae swamp near mouth of Bonaventure River, July 31, 1902, *Williams & Fernald;* island at mouth of Little Cascapedia River, July 28, 1904, *A. S. Pease;* alluvium of Nouvelle River, July 19 & 20, 1904, *Collins & Fernald;* bank of Restigouche River, Matapedia, June 28, 1904, *Fernald;* banks of Matane River, August 5, 1904, *F. F. Forbes;* vicinity of Montmorenci Falls, August 7, 1902, *Williams & Fernald,* July 30, 1905, *J. Macoun,* no. 68,792. New Brunswick: beach of Aroostook River, Four Falls, August 14, 1901, *Fernald.* Maine: abundant on beach of St. John River, Fort Kent, June 16, 1898, *Fernald,* nos. 2471, 2472; beach of Aroostook River, Fort Fairfield, September, 1896, September 19, 1900, June 6, 1901, *Fernald.*

A very common riparian species in the calcareous districts from Aroostook County, Maine, and adjacent Quebec to Newfoundland, which has been mistaken at various times and in various states of development for *S. glaucophylla* Bebb and *S. Barclayi* Anderss. It is the northeastern shrub which was included in the 7th edition of Gray's Manual under *S. glaucophylla.* That species, which is apparently confined to the sands of the Great Lakes, is quite as variable as *S. glaucophylloides* in its foliage, but in *S. glaucophylla* this is very much heavier or thicker than in the more eastern shrub. In *S. glaucophylla,* furthermore, the fruiting aments are much larger, 5.5–8 cm. long, 1.8–2.5 cm. thick; the pubescence of the peduncle and rhachis longer and denser; the scales more copiously long-villous; the capsules longer, 8–10 mm. long, and obliquely rounded, not cordate, at base; and the pedicels distinctly exceeding the scales and many times longer than the nectaries.

Salix Barclayi, a species of extreme northwestern America, for which foliage-specimens of *S. glaucophylloides* have been mistaken, differs in its less toothed leaves, much longer scales (with the silky beard nearly equaling the capsules), the shorter pedicels, and the longer stigmas. The Newfoundland *S. latiuscula* Anderss., which has also been confused with *S. Barclayi,* has densely sericeous-tomentose capsules and remarkably long reflexed stigmas, much longer than in any other species known to the writer, and its foliage is not conspicuously glaucous beneath.

Salix **paraleuca,** n. sp., frutex 3–4 m. altus, ramis fuscis sublucidis, ramulis cinereo-pilosis glabratisque; foliis oblanceolatis vel oblanceolato-oblongis subcoriaceis planis juvenilibus rufo-pilosis, maturis glabris 3.5–7.5 cm. longis 1.3–2.2 cm. latis supra viridibus lucidis subtus glauco-albescentibus apice subacutis basi attenuatis margine crenato-dentatis, dentibus glanduligeris, petiolo griseo-piloso 4–6 mm. longo; stipulis nullis; amentis fructiferis breviter pedunculatis 2–2.5 cm. longis 7–8 mm. crassis, pedunculo 2–3 mm. longis 1–2 foliis instructis valde albido-pilosis, pilis 1–2 mm. longis; squamis oblongo-ovatis obtusis 2 mm. longis atris albido-pilosis, pilis 2–2.5 mm. longis; capsulis conico-cylindricis obtusis 3.5–4 mm. longis cinereo-tomentosis, stylo tenui 0.5 mm. longo, stigmatibus valde bifidis adscendentibus, pedicello 0.7 mm. longo nectarium duplo superante.

Shrub 3–4 m. high; branches fuscous, somewhat shining; branchlets ashy-pilose and glabrate: leaves oblanceolate or oblanceolate-oblong, subcoriaceous, flat, the young reddish-pilose, the mature glabrous, 3.5–7.5 cm. long, 1.3–2.2 cm. wide, green and shining above, glaucous-whitened beneath, subacute at apex, attenuate at base; the

margin crenate-dentate, with gland-tipped teeth; petiole ashy-pilose, 4–6 mm. long: stipules none: fruiting aments short-peduncled, 2–2.5 cm. long, 7–8 mm. thick; peduncle 2–3 mm. long, bearing 1 or 2 leaves, very white-pilose with hairs 1–2 mm. long: scales oblong-ovate, obtuse, 2 mm. long, black, white-pilose with hairs 2–2.5 mm. long: capsules conic-cylindric, obtuse, 3.5–4 mm. long, ashy-tomentose; style slender, 0.5 mm. long; stigmas strongly bifid, ascending; pedicel 0.7 mm. long, twice as long as the nectary.— Quebec: banks of the Grand River, Gaspé County, June 20–July 3, 1904, *Fernald* (type in Gray Herb.).

Nearest related, apparently, to the complex known as *S. phylicifolia* L.; but distinguished by the obviously crenate-dentate leaves with their very glaucous lower surfaces and their characteristic pubescence, as well as by the very short blunt capsules which, in form, suggest those of *S. sericea*, to which *S. paraleuca* has no close affinity.

Salix **stenocarpa**, n. sp., frutex altus, ramis castaneis lucidis ramulis pilosis glabratisque; foliis oblanceolatis planis, juvenilibus albido-villosis glabratis 4–10 cm. longis 1.5–3 cm. latis supra viridibus sublucidis ad nervum albido-pilosis subtus glauco-albidis apice acuminatis basi attenuatis vel rotundatis margine undulato-dentatis, dentibus glanduligeris, petiolo piloso 4–10 mm. longo; stipulis subreniformibus; amentis fructiferis pedunculatis laxis 2.5–3.5 cm. longis 8–10 mm. crassis, pedunculo 8–10 mm. longis 3–5 foliis parvis instructis breviter tomentosis; squamis anguste oblongis obtusis 2.5–3 mm. longis fulvis albido-pilosis, pilis circa 1 mm. longis; capsulis subulato-attenuatis 4–5 mm. longis albido-tomentosis, stylo vix 1 mm. longo, stigmatibus stylum aequantibus integris, pedicello vix 0.5 mm. longo nectarium paulo superante.

Tall shrub; the branches castaneous and shining; the branchlets pilose, finally glabrate: leaves oblanceolate, flat; the young white-villous, glabrate, 4–10 cm. long, 1.5–3 cm. wide, green and somewhat shining above, white-pilose along the midrib, glaucous-whitened beneath, apex acuminate, base narrowed or rounded, margin undulate-dentate with gland-tipped teeth; petiole pilose, 4–10 mm. long; stipules subreniform: fruiting aments peduncled, loose, 2.5–3.5 cm. long, 8–10 cm. thick; peduncle 8–10 mm. long, bearing 3–5 small leaves, short-tomentose: scales narrowly oblong, obtuse, 2.5–3 mm. long, yellow-brown, white-pilose with hairs about 1 mm. long: capsules subulate-attenuate, 4 5 mm. long, white-tomentose; style barely 1 mm. long; stigmas equaling the style, entire; pedicel barely 0.5 mm. long, a little longer than the nectary.— Quebec: ledgy banks of Restigouche River, Matapedia, June 28, 1904, *Fernald* (type in Gray Herb.).

Related to *S. paraleuca*, but differing in its more elongate shallowly toothed leaves, (when young with characteristic white pubescence), the

longer-peduncled and more slender aments, the longer yellowish scales, the more slender and pointed capsules and the entire stigmas. From *S. phylicifolia* distinguished by the pubescence of the much longer leaves, the shorter capsules, and the entire stigmas.

Salix rostrata Richardson, var. **capreifolia**, n. var., frutex altus vel arbor mediocris usque 4 m. altus, ramulis crassis dense canescento-tomentosis, tomento persistente; foliis ovatis vel late ellipticis vel obovatis subtus valde cinereo-tomentosis tomento persistente; amentis eis formae typicae similibus.

Tall shrub or small tree, up to 4 m. high; branchlets thick, densely canescent-tomentose, with persistent tomentum: leaves ovate, broadly elliptic or obovate, very cinereous-tomentose beneath with persistent tomentum: aments similar to those of the typical form of the species.— Newfoundland, eastern Quebec and Nova Scotia. Newfoundland: Fogo Island, July 27, 1903, *J. D. Sornborger;* cool thicket, Western Bay, Conception Bay, August 21, 1914, *G. S. Torrey;* thicket, St. John's, August 1, 1911, *Fernald & Wiegand*, no. 5261; gravelly strand, Southeast Arm, Bonne Bay, August 31, 1910, *Fernald & Wiegand*, no. 3181; calcareous gravelly terrace, Port à Port, August 16, 1910, *Fernald & Wiegand*, no. 4259. Quebec: cold limestone cliffs, Percé, August 16 & 19, 1904, *Collins, Fernald & Pease;* calcareous sea-cliffs, Tourelle, August 19–21, 1905, *Collins & Fernald* (type in Gray Herb.). Nova Scotia: roadside, Pictou, July 13, 1914, *Fernald & St. John*, no. 11,023.

In typical *S. rostrata* Richardson (*S. Bebbiana* Sargent) the new branchlets are pubescent at tip, but the pubescence is early deciduous; and the leaves, varying from ovate-oblong to oblanceolate, lose much of their pubescence in age, becoming glabrate or only sparsely pubescent but obviously veiny beneath. In the common Rocky Mountain representative of the species, *S. rostrata*, var. **perrostrata**, n. comb., = *S. perrostrata* Rydberg, Bull. N. Y. Bot. Gard. ii. 163 (1901), the leaves are less rugose or almost plane and glabrate in age, and the branchlets glabrous or quickly glabrate. And in the largest extreme of the species, var. *luxurians* Fernald, Rhodora, ix. 223 (1907), with the large capsules (9–12 mm. long) on pedicels 5–8.5 mm. long, the branchlets are as pubescent as in var. *capreifolia*, but the very large leaves are sparingly pubescent or glabrescent and as little rugose as in var. *perrostrata.* The var. *capreifolia* presents the most extreme development of pubescence in the species and may prove to be the same as *S. vagans*, 1. *S. rostrata*, forma *latifolia* Anderss., Mon. Sal. 88 (1865) described from Vancouver Island, while var. *perrostrata* shows the opposite tendency. In its foliage var. *capreifolia* so closely simulates

the European *S. caprea* that foliage-specimens of the two can be readily distinguished only by the more tomentose branchlets of the newly proposed variety.

Another very extreme variant, apparently of *S. rostrata,* is a large shrub or small tree of western Newfoundland, which is quite as pubescent as var. *capreifolia* but has remarkably slender and elongate fruiting aments, long scales and comparatively short pedicels. When better known this may prove to be a distinct species but for the present it is proposed as

S. rostrata, var. **projecta,** n. var., frutex altus vel arbor mediocris; ramulis crassis dense canescento-tomentosis, tomento persistente; foliis elliptico-ovatis vel oblongis obtusis vel subacutis, junioribus utrinque dense tomentosis paulo glanduloso-serratis; amentis fructiferis 6–8 cm. longis 1–1.5 cm. crassis; squamis fulvis lineari-oblongis obtusis leviter pilosis 3–4 mm. longis; capsulis lanceolato-subulatis dense villosis 5–6 mm. longis, pedicellis dense villosis 2–3.5 mm. longis. Tall shrub or small tree, with stout densely cinereous-tomentose branchlets; the tomentum persistent: leaves elliptic-ovate or oblong, obtuse or subacute, the young densely tomentose upon both surfaces, sparingly glandular-serrate: fruiting aments 6–8 cm. long, 1–1.5 cm. thick: scales light brown, linear-oblong, obtuse, slightly pilose, 3–4 mm. long: capsules lance-subulate, densely villous, 5–6 mm. long; pedicel densely villous, 2–3.5 mm. long.— Newfoundland: woods, Wild Cove (south of Bay of Islands), June 11, 1896, *A. C. Waghorne* (type in Gray Herb.).

Differing from all the described varieties of *S. rostrata* in the slender elongate ament, the long scales, the short capsules and the pedicels shorter than the scales; in *S. rostrata* and its described varieties the scales being 1–3 mm. long, the capsules 5–12 mm. long, and the mature pedicels 3–8 mm. long and very distinctly exceeding the scales.

Salix **leiolepis,** n. sp., frutex depressus, trunco ramisque subterraneis repentibus, ramulis assurgentibus 3–10 cm. altis pallidis glabris apice foliiferis; foliis crassis elliptico-rotundatis 0.7–2 cm. longis 0.5–1.4 cm. latis supra viridibus glabris impresse nervosis subtus glauco-pallidis reticulato-venosis glabris vel juvenilibus sericeo-tomentosis glabratisque, margine integerrimis vel crenatis paulo revolutis, petiolis glabris 1–4 mm. longis; gemmis terminalibus olivaceis glabris anguste ellipsoideis obtusis 4–5 mm. longis 1.5–2.5 mm. crassis; amentis terminalibus breve pedunculatis, fructiferis densifloris ellipsoideis 5–11 mm. longis, pedunculis 1–2.5 mm. longis glabris; squamis olivaceis vel fulvescentibus rotundato-obovatis glabris 1 mm. longis; capsulis subsessilibus conico-ovoideis obtusis 3.5–4.5 mm. longis glabris purpurascentibus, stylo brevissimo stigmatibus divergentibus bifidis, nectarii laciniis 2 filiformibus 1 mm. longis.

Depressed shrub with subterranean repent trunk and branches; the assurgent branchlets 3–10 cm. high, pale, glabrous, leafy at the tip: leaves thick, elliptic-rotund, 0.7–2 cm. long, 0.5–1.4 cm. wide, green and glabrous above, with impressed nerves, glaucous-whitened beneath and reticulate-veiny and glabrous, or the young silky-tomentose and glabrate; the margin entire or crenate, somewhat revolute; petioles glabrous 1–4 mm. long: terminal buds olive, glabrous, narrowly ellipsoid, obtuse, 4–5 mm. long, 1.5–2.5 mm. thick: aments terminal, short-peduncled; the fruiting densely flowered, ellipsoid, 5–11 mm. long; the peduncle 1–2.5 mm. long, glabrous: scales olive or somewhat reddish-yellow, rounded-obovate, glabrous, 1 mm. long: capsules subsessile, conic-ovoid, obtuse, 3.5–4.5 mm. long, glabrous, purplish; style very short, the divergent stigmas 2-cleft; the prongs of the nectary 2, filiform, 1 mm. long.— Newfoundland: mossy knolls on the limestone tableland, altitude 200–300 m., Table Mountain, Port à Port Bay, July 17, 1914, *Fernald & St. John*, no. 10,825 (type in Gray Herb.).

In habit and foliage closely simulating *S. reticularis* L. and the most dwarfed alpine extreme of *S. vestita* Pursh; but differing from both in the glabrous scales and capsules; also from *S. reticularis* in its short peduncles and thick fruiting aments, and from *S. vestita,* which is the most abundant willow of Table Mountain, in its glabrous or quickly glabrate foliage and the smaller and more slender glabrous greenish terminal buds, the terminal buds of *S. vestita* being obovoid, pubescent and reddish and measuring 6–11 mm. long by 3–5 mm. thick.

Gray Herbarium.

FORMS OF ARENARIA LATERIFLORA.

R. W. Woodward.

In a former article (Rhodora, **15**: 209) the writer called attention to two forms of *Arenaria lateriflora* occurring in Southern New England, a large-flowered form with long filaments and well developed anther-cells, and a second form having shorter petals and imperfectly developed anther-cells borne on very short filaments. Further observations the past summer indicate that the anther-cells of the second form are destitute of pollen. The two forms may be characterized as follows.

Petals averaging 7.5 mm. in length: filaments about twice the length

of the calyx, equalling or exceeding the styles; anther-cells plump, 0.75 mm. long, with copious pollen; calyx 2.5 mm. long. This plant fruits regularly.

Petals averaging 4 mm. in length: filaments shorter than, or barely equalling the calyx, often hidden within it; anther-cells shrunken, 0.25 mm. long, without pollen: this plant is dependent upon the other for pollination, and may, or may not, develop fruit according to circumstances.

Neither form appears to fruit freely, and a vigorous individual does not, as a rule, ripen more than one or two capsules. Both forms show a marked tendency to grow in colonies, consisting exclusively of one form of plant, but neighboring colonies do not vary greatly in fruitfulness, whether consisting of the large-, or small-flowered variety. Mention was made in the previous article of an extensive station in dry, open woods in Franklin, Connecticut, where the small-flowered form seemed to be the only one present and yet fruited well. The writer has since been able to locate several small colonies of the plant with large flowers in the same woods. It is unusual in Franklin to find the latter form in dry soil, as it exhibits a decided preference for meadow lands. Both forms fruit about alike in these woods. But there is a marked difference at another Franklin station, a wet meadow with a border of dry gravel. In the meadow the large-flowered *Arenaria* is abundant and unusually fruitful. On the gravel, however, where the small-flowered *Arenaria* is even more abundant, one needs to search a long time to find a fruiting capsule. This may be due to interference with insect visitations by the dense growth of grass, which springs up on the meadow in early June, and soon overtops and conceals the smaller plants at its base.

In an interesting paper on *A. lateriflora* in Rhodora for March, 1914, Mr. Wilhelm Suksdorf suggests that the long-stamened flower is not fertile and that the two forms are the two sexes of a dioecious species. Very likely the species may prove to be dioecious in some localities, but such have not come under the writers observation. During the past summer he carefully marked many plants with long-stamened flowers and these uniformly produced seeds which appear to be normal. A suite of specimens has been deposited in the Gray Herbarium.

New Haven, Connecticut.

THE VARIETIES OF HIERACIUM SCABRUM.

M. L. Fernald and Harold St. John.

On the Magdalen Islands and on Sable Island plants clearly allied to the continental *Hieracium scabrum* Michaux depart in some characters from the typical *H. scabrum*, as shown by Michaux's type material and by the common plant extending from Lake Mistassini to the mountains of North Carolina. In true *H. scabrum* the lower internodes of the stem, the petioles, and the midribs (beneath) are conspicuously clothed with long slender, often sordid, trichomes 2–3 mm. in length, while the upper surface of the leaf bears somewhat scattered trichomes (on the median cauline leaves 0.5–2. mm. long). The branches of the inflorescence and the peduncles are more or less tomentose and heavily beset with dark stipitate glands, but neither the tomentum nor the glands extend to the lower half of the plant.

In the Sable Island plant the stem lacks the elongate trichomes and is covered, often from base to summit, by a dense pannose white tomentum. Numerous short stiff trichomes, barely 1 mm. in length, are mixed with the characteristic glands, while both surfaces of the leaf are glabrous except for minute, commonly gland-tipped hairs. In the branches of its inflorescence and its involucre the Sable Island plant closely matches dwarfed, but large-headed, plants of *H. scabrum* and in its fruit-characters seems inseparable from that species.

On the Magdalen Islands true *H. scabrum* occurs, but the distinctive plant of the region differs in having the lower half of the stem and the leaves nearly glabrous or at most with very short sparse trichomes (not exceeding 0.5 mm. in length) often mingled with scattered glands. A similar and apparently indistinguishable plant is represented in the Gray Herbarium from other sections of eastern Quebec and from north-central Maine, where it has been collected with typical *H. scabrum*, while all the material seen by us from the north side of Lake Superior and the Keweenaw Peninsula of Michigan is of this extreme variant.

In the course of this study a singular plant from Athens, Illinois, has attracted our attention and seems to represent another extreme of *H. scabrum*, in this case tending to an excessive development of slender trichomes. In the Athens plant the sordid trichomes of the lower half of the stem, the midribs, and both leaf-surfaces are almost uni-

formly developed, those on the upper surface of the median cauline leaves being 3–5 mm. long.

In their extremes these four variants appear so different that they might, to some botanists, seem to be distinct species; but in the essential characters of the inflorescence, including the involucre and achenes, they appear inseparable, and their differential characteristics are merely somewhat localized recombinations of a series of variable tendencies of the pubescence. As geographic varieties, however, they are very definite and we propose those heretofore unnamed as

Hieracum scabrum Michx., var. **leucocaule**, n. var., humile 1–2.5 dm. altum multis cum foliis; caule prope apicem et saepius per totam longitudinem cum tomento denso et albo tecto et cum glandulis atris stipitatisque instructo; foliis 15–25 coarctatis oblongis vel elliptico-obovatis, superioribus gradatim minoribus, foliis mediis caulinis 2–5 cm. longis, utrinque brevissime glanduloso-pilosis infra costa hispidis cum pilis 0.5 mm. longis vel saepe brevioribus quibus cum glandulis stipitatis mixtis.

Low, 1–2.5 dm. high, very leafy: stem invested toward the summit and more often throughout with dense white tomentum mixed with dark stipitate glands: leaves 15–25, crowded, oblong or elliptic-obovate, gradually diminishing upward, the median cauline ones 2–5 cm. long, both surfaces minutely glandular pilose, the midrib hispid beneath with hairs 0.5 mm. or less in length intermixed with stipitate glands.— Nova Scotia: Sable Island, September, 1911, *H. T. Gussow*, Empetrum heaths and sand dunes, September 6 and 11, 1913, *St. John*, nos. 1357 & 1358 (type in Gray Herbarium).

H. scabrum Michx., var. **tonsum**, n. var., quam forma typica, gracilius 3–5 dm. altum subscaposum vel cum foliis paucis instructum; caule infra glabrescente vel pilis 0.2–0.6 mm. longis saepe paulum glandulosis hispidulo, caulibus apice ramisque inflorescentiae albido-tomentosis cum glandulis nigris stipitatis valde tectis; foliis plerumque radicalibus, caulinis 4–11 parvis remotis, utrinque glabris vel paulo brevi-setulosis, costis infra marginibusque cum trichomis vix 0.5 mm. longis hispidis saepe cum glandulis sparsis permixtis.

Rather slender, 3–5 dm. high sparingly leafy or sub-scapose: stem glabrescent or hispidulous below with hairs 0.2–0.6 mm. long, and often slightly glandular; summit of the stem and branches of the inflorescence white-tomentose and heavily invested with black stipitate glands: leaves mostly basal, the cauline 4–11, remote and small; both surfaces glabrous or sparingly short setulose, the midribs (beneath) and margins hispid with trichomes barely 0.5 mm. long, often mingled with scattered glands.— Quebec: dry clearings, southwest of Etang du Nord, Magdalen Islands, August 22, 1912, *Fernald, Long & St. John*, no. 8291 (type in Gray Herbarium); recent clearing, Douglastown, Gaspé County, August 21 and 22, 1904, *Collins, Fernald & Pease;*

vicinity of Cap à l'Aigle, August 3, 1905, *J. Macoun*, no. 68,351, in part. MAINE: dry open woods, Dover, August 7, 1895, *Fernald*, no. 398, in part. ONTARIO: Lake Superior region, *Loring*. MICHIGAN: Isle Royale, August 10, 1909, *W. S. Cooper*, no. 32; moist grassy places, Keweenaw County, July, 1889, *O. A. Farwell*, no. 49a.

H. SCABRUM Michx., var. **intonsum**, n. var., caule infra cum trichomis gracilibus sordidis 3–5 mm. longis villoso; foliis pluribus 20–30 subaequalibus vel paucioribus 12–20 superioribus manifeste minoribus, utrinque villosis cum uniformibus longis sordidis trichomis, quibus foliorum mediorum 3–5 mm. longis; ramis inflorescentiae tomentosis glandulosisque.

Tall, 5–11 dm. high; stem densely villous below with slender sordid trichomes (3–5 mm. long): leaves rather numerous (20–30) and subequal, or fewer (12–20) and rapidly decreasing upward, villous on both surfaces with uniform long sordid trichomes, those of the median leaves 3–5 mm. long: branches of the inflorescence tomentose and glandular. — ILLINOIS: "In nemorosis sterilibus pr. Athenas," September, *E. Hall*, no. 35 (TYPE in Gray Herbarium); and "In collibus aridis," Athens, *Hall*, nos. 36, 178 & 179.

GRAY HERBARIUM.

AVENA FATUA IN EASTERN MASSACHUSETTS.— On July 1, 1914, one plant of an unfamiliar Oat was found growing by the roadside on Eliot St., Sherborn, Mass. This was placed with the Boston Society of Natural History (No. 1516). On August 13 another and larger plant was collected on Rockwood St. This was divided, one half being sent to the Boston Society (No. 1563), and the other to the Gray Herbarium where my determination as *Avena fatua* L. was confirmed by Mr. Frank C. Seymour, who also informed me that probably the species had not been found nearer than New Jersey. On August 17, another plant (No. 1567) was found on Eliot Street and August 26 still another in an abandoned chicken-yard on Main Street. The stations are all at some distance from each other. This is probably the first record of the finding of this species in New England the range as given in the "Manual" being "Ont. and O. (rare); Wisc., Ill., and westward." — MARTHA LOUISE LOOMIS, Sherborn, Massachusetts.

Avena fatua was reported among the ballast weeds of New York and Philadelphia in the Preliminary Catalogue of Anthophyta and Pteridophyta of the Torrey Botanical Club, page 89 (1888). It was also included in J. N. Bishop's Catalogue of all Phaenogamous and Vascular Cryptogamous Plants in the State of Connecticut, ed. 2, page 21 (1896) and ed. 3, page 8 (1901), as occur-

ring at Kensington, Connecticut, *Cowles.* But this Connecticut record seems never to have been confirmed as the species was excluded from the later and much more critically prepared Catalogue of the Flowering Plants and Ferns of Connecticut by Graves and others, page 425 (1910) — Ed.

Pinus Banksiana on Nantucket.— In line with recent discoveries of Hudsonian and subarctic plants on Cape Cod and Long Island, notably *Rubus Chamaemorus* on Long Island, and *Elymus arenarius* on Cape Cod, is the finding of the gray, or northern scrub-pine, *Pinus Banksiana* Lamb. at Wauwinet on the eastern shore of the Island of Nantucket, far removed from the nearest coastal stations for this tree on Penobscot Bay. As found by me on September 9, 1914, it grows near the bluff overlooking the sea in a rather exposed locality. Twenty trees, some badly wind-swept, and therefore, of a broad, spreading habit, were grouped together at the exposed northeastern edge of a natural thicket consisting of the usual shrubs and small trees of such thickets on Nantucket.— John W. Harshberger, University of Pennsylvania.

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THE REDISCOVERY OF AN HISTORIC COLLECTION OF MASSACHUSETTS PLANTS.

F. G. Floyd.

My time afield during the past summer was spent in Amherst, Massachusetts. In excursions, taken from that point as a centre, I found several plants of interest. For instance, *Coronilla varia* L. was new to me. It was well established and abundant at one point. On Sugar Loaf Mountain at the north and on one of the Holyoke Range on the south I found *Asclepias verticillata* L. At two places I observed *Asclepias tuberosa* L., the plants being very robust and the flowers strikingly handsome orange. *Potentilla recta* L. was seen once and *Lysimachia vulgaris* L. was collected by the roadside not far from the College. This last is a species not listed in recently published Catalogue of Amherst Plants by Prof. Stone. *Specularia perfoliata* (L.) A. DC., also new to me, was found in abundance on some of the mountains.

But what interested me as much as anything was the finding of an old and historic herbarium of significance in relation to our state flora. In the Appendix of the Seventh Annual Report of the Massachusetts Board of Agriculture is a "Catalogue of Plants" (the publication mentioned as no. 126 of Miss Day's List of Local Floras of New England). It has been thought that this Catalogue of Plants, which is nothing but a bare list of names, was an attempt at a flora of Massachusetts. On page 139 of the above Report it is seen, however, that at one time there existed what was known as the State Cabinet or Agricultural Museum, consisting of actual specimens and embracing other branches of natural history as well as botany, it being stated

that the "Catalogue of Plants" is in reality a list of the specimens of a botanical nature contained in the State Cabinet.

This much I knew before reaching Amherst. I had already made inquiry at every likely place in Boston and vicinity and had not been able to discover this old herbarium. However, somebody at the State House seemed to remember that it had been turned over to the Massachusetts Agricultural College. Therefore, when I found myself at Amherst, I took the first opportunity to look up the College Herbarium and make inquiries. I found Prof. Stone, one of the members of our New England Botanical Club, in charge, and on explaining my quest he directed me to certain cases that contained an ancient herbarium, turned over to the College many years ago, which he thought came from the State House in Boston.

He very kindly placed the facilities of the laboratory at my service and later I examined the collection carefully. The plants have been kept intact, that is as a distinct collection. I compared them sheet by sheet with the published list in the Agricultural Report, which I obtained from the College Library and found an exact agreement — that is to say, every plant listed in the Catalogue had a representative, at least one sheet, in the herbarium, and I did not find any plants in the herbarium that were not given in the list. So I am convinced that the collection at Amherst is the old "State Cabinet" and that the botanical specimens are the basis of Flint's "Catalogue of Plants," published in the Seventh Annual Report of the Massachusetts Board of Agriculture.

The specimens are stuck to sheets of soft bibluous paper with strips usually. Each sheet has two labels, one loose with a heading "Mass. State Herbarium" and the botanical name, the other pasted on the sheet and written in a different hand gives the botanical name, common name, date and sometimes the locality. I could not examine the entire collection in detail. Of the few that I did examine more particularly the following had localities indicated.

Juniperus virginiana L. Lincoln, June 14, 1834, near Flint's Pond.

Juniperus virginiana L. Malden.

Pinus resinosa Ait. Dr. Stearns, Sudbury. A botanical description of which I cannot find in any elementary works.

Typha angustifolia L. Charlestown.

Holcus odoratus L.

Poa aquatica, Malden, meadows, wet, 4 June, 1829.

Poa nervata, Malden, meadow, 4 June, 1828.

Ranunculus Cymbalaria, Chelsea, Brighton, C. River salt marsh.

This State Cabinet or, as it is called, Massachusetts State Herbarium is not mentioned in Miss Day's article "The Herbaria of New England," published in Vol. 3 of RHODORA. Now that the resting place of the collection has been located it is probable that a more careful examination of it than I was able to make would be well worth while.

WEST ROXBURY, MASSACHUSETTS.

A NEW MARITIME POLYGONUM FROM NOVA SCOTIA.

M. L. FERNALD.

IN 1913 the writer pointed out [1] that the large-fruited glaucous *Polygonum* of the coastal sands of the eastern United States is *P. glaucum* Nutt., not *P. maritimum* L. for which it had long been mistaken; and that about the Gulf of St. Lawrence these large-fruited strand species are represented by *P. Raii* Babington, which is also found on the Bras d'Or Lakes of Cape Breton.

During the past July, finding it necessary to "kill time" for twelve hours between North Sydney and Pictou, Nova Scotia, Mr. St. John and the writer fortunately selected Grand Narrows on Bras d'Or Lake as a desirable place to investigate. There, on the gravel beach, *P. Raii* was abundant, as we had expected; but the chief surprise of our day was another large-fruited species growing with it in the gravels and quickly distinguishable as far as it could be seen by its color, the leaf-outline and the comparatively inconspicuous perianths, in which it strongly contrasted with the very glaucous and conspicuous *P. Raii*. The peculiar plant proves to be unique in the group to which it belongs, presenting characters which ally it to *P. Raii* on the one hand and to *P. Fowleri* Robinson on the other but which clearly separate it from each. It is here proposed as

[1] RHODORA, xv. 68–73 (1913).

Polygonum **acadiense**, n. sp., annuum prostratum paulo vel vix glaucum rubro-viride, caulibus gracilibus, internodiis 1.5–3.5 cm. longis; ochreis internodo multo brevioribus 1–1.3 cm. longis albido-hyalinis basi purpurascentibus remote circa 6-nerviis ovato-oblongis acutis adpressis demum bipartitis lacerisque; foliis lineari-oblanceolatis acutis submembranaceis subtus 1-nerviis, primariis 2–4.5 cm. longis 2–7 mm. latis petiolo 3–8 mm. longo; axillis 1–3-floris; pedicellis calycem subaequantibus apice valde articulatis; calyce 4 mm. longo turbinato-campanulato profunde 4–5-partito, lobis oblongis obtusis subaequalibus margine albido- vel roseo-petaloideo basi non angustatis; achenio olivaceo lucido ovato-lanceolato 6 mm. longo 2–3 mm. lato a calyce arcte amplectente valde exserto.

Annual, prostrate, slightly or scarcely glaucous, reddish-green; the stems slender; the internodes 1.5–3.5 cm. long: ochreae much shorter than the internodes, 1–1.3 cm. long, white-hyaline, purplish at base, remotely about 6-nerved, ovate-oblong, acute, appressed, finally 2-parted and lacerate: leaves linear-oblanceolate, acute, submembranaceous, 1-nerved beneath; the primary 2–4.5 cm. long, 2–7 mm. wide, with petiole 3–8 mm. long: axils 1–3-flowered: pedicels about equaling the calyx, obviously articulated at apex: calyx 4 mm. long, turbinate-campanulate, deeply 4–5-parted; the lobes oblong, obtuse, subequal, with white- or roseate-petaloid margin, not narrowed at base: achene olivaceous, shining, ovate-lanceolate, 6 mm. long, 2–3 mm. wide, closely invested by the calyx, conspicuously exserted.—Nova Scotia: gravelly strand of Bras d'Or Lake, Grand Narrows, Cape Breton, July 20, 1914, *Fernald & St. John*, no. 11,042 (type in Gray Herbarium).

Nearest related to *P. Raii* which has much more glaucous mostly oblong-lanceolate leaves, shorter ochreae (3–8 mm. long) with brownish rather than purple bases, much more petaloid and broader less appressed oval overlapping sepals and shorter broader and darker achenes (4.5–5.3 mm. long, 3–3.5 mm. broad). On the strand at Grand Narrows *P. acadiense* and *P. Raii* were growing together. The material of *P. Raii*, collected and pressed at the same time as the other, remained in press several weeks and lost essentially no foliage; but the material of *P. acadiense* was completely dry in five days and many of its leaves had disarticulated.

P. acadiense has the calyx and the olivaceous exserted achene similar to those of *P. Fowleri* Robinson, but in that species the achene is very broadly ovate and only 4 mm. long; the more fleshy short leaves are elliptic to broadly oblanceolate, with rounded tips; and the broad flaring obscurely nerved ochreae are only 3–6 mm. long.

In the form of its sepals and achenes *P. acadiense* is similar to *P.*

exsertum Small; but that species, which abounds on some of the salt marshes of Nova Scotia and New Brunswick, is a tall erect plant with brown many-nerved ochreae, and with the narrower shorter sepals alternately long and short, the outer or longer ones comparatively firm and green.

Gray Herbarium.

NOTES ON THE FLORA OF THE PENOBSCOT BAY REGION, MAINE.

Albert F. Hill.

The following plants collected for the most part during the summer of 1913 at various places about Penobscot Bay seem worthy of note chiefly as regards their distribution. Extensions of ranges are based on the distribution of the plants as shown by the material in the Gray Herbarium and the herbarium of the New England Botanical Club.

Juniperus horizontalis Moench. Additional stations to those cited for this region by Norton in Rhodora for August, 1913, are Isle au Haut and Swans Island where the plant is very common, forming large colonies on exposed granite sea cliffs.

Pinus rigida Mill. The common Pitch Pine of southern New England occurs at almost its northern limit in this region. In addition to several stations on Mount Desert it is common on the sterile slopes of Mt. Champlain at Isle au Haut and at several localities on the mainland at Brooklin.

Agrostis alba L., var. aristata Gray. This rather uncommon variety was collected on the shady bank of a stream at Brooklin. Only four other Maine stations are represented in the above herbaria.

Ammophila arenaria (L.) Link. Owing to the rocky nature of the coast and the consequent scarcity of sand dunes this plant, so common to the south and in the Maritime Provinces, has hitherto been unreported from the region east of Knox County in Maine. Only one small station was found on the southern side of Swans Island.

Elymus virginicus L., var. hirsutiglumis (Scribn.) Hitchc.

Two collections made in Brooklin are the first reported for the state. However, part of the material in the Mount Desert Herbarium passing as the typical form is in reality this variety.

Agropyron repens (L.) Beauv., var. pilosum Scribn. This plant reported occasionally from various localities in the state seems to be rather common in this region. Collections were made at Swans Island, Isle au Haut and Deer Isle, all on sea beaches.

Scirpus cyperinus (L.) Kunth. This sedge is known from Penobscot County southward and southwestward with isolated stations at Mount Desert and Isle au Haut.

Scirpus pedicellatus Fernald. As represented in the above herbaria this plant has an interesting distribution. It is common across the northern part of the state and on the coast as far east as Kennebec County. It reappears again around Penobscot Bay. Miss Furbish found it at Swans Island and two collections were made this year at Isle au Haut.

Carex canescens L. While common inland in Maine, this plant is much more restricted on the coast than the varieties. It has been collected only at Cutler, Brooklin and Swans Island.

Carex stellulata Good., var. angustata Carey. Until now the only recorded coastal station for this common inland plant has been Mount Desert. To this may be added a station at Flyes Point, Brooklin.

Carex salina Wahlenb., var. kattegatensis (Fries) Almq. A fifth Maine station at Brooklin can now be added to those at Lubec, West Pembroke, Waldoboro and Chebeague Island.

Juncus Greenei Oakes & Tuckerm. With the exception of a few Mount Desert stations, Brooklin is the eastern limit of this rush.

Betula lutea Michx. f. In his article on "Woody Plants of Brooklin, Maine" in Rhodora for September, 1910, A. H. Graves does not include the yellow birch in the list. There are several stations in Brooklin and the tree is also common on the islands.

Quercus rubra L., var. ambigua (Michx. f.) Fernald. The only fruiting Red Oak seen at Brooklin was this variety and it is quite likely that the other trees, all of which were close at hand, will prove to be the same.

Arenaria peploides L., var. robusta Fernald. Norton, in his article above referred to, states that this plant is strictly local and cites a few stations on the outer islands. The plant is quite frequent

at Brooklin, occurring where there is the least semblance of a sandy beach. There are also several plants of the same variety on Swans Island.

Ranunculus laxicaulis (T. & G.) Darby. This was collected in a muddy pond hole at South Deer Isle, its easternmost station. Norton reports the plant from apparently the same locality.

Camelina sativa (L.) Crantz. This plant occurs sparingly as a weed in the northern section of Maine, but has not been reported on the coast east of York. It was fairly abundant in a potato field at Brooklin.

Erysimum cheiranthoides L. This has a similar range in the state. It was found in profusion on a sandy barrier beach at Flyes Island, Brooklin. The only other coastal station in the two herbaria is Cumberland.

Sisymbrium officinale (L.) Scop. The second Maine station for this plant is a sandy beach at Swans Island Head. Previously it had been known only from Brownville.

Crataegus Jonesae Sarg. This thorn, described from Mount Desert and very common on the western shore of Penobscot Bay, is equally common at Brooklin and on the islands. It has been also recorded from Washington County.

Lathyrus palustris L., var. pilosus (Cham.) Ledeb. The distribution of this plant as shown in the two herbaria is interesting. It occurs from Eastport along the coast to Mount Desert but is unrepresented from the area between there and the coast of Massachusetts. It is very abundant in the Penobscot Bay region, both on the mainland and the islands.

Rubus pubescens Raf., var. pilosifolius A. F. Hill. The pubescent variety of the dwarf raspberry was first collected at Brooklin.

Empetrum nigrum L. This is reported as 'local' by Norton and 'rare' by Graves, but it is very common on headlands and exposed granite rocks, more so on the outer islands than on the mainland.

Corema Conradii Torr. This is extremely common on rock outcrops at Swans Island and at Brooklin, where it is found, not in a bog in the Central Tract as Graves states, but on rocks at the edge of the bog. It has been previously reported from Isle au Haut.

Ilex verticillata (L.) Gray, var. padifolia (Willd.) T. & G. This was found very frequently at Brooklin and on the islands, though there had been no specimens from the state in the herbaria before,

Examination of the Mount Desert material shows much of it to be this variety.

DECODON VERTICILLATUS (L.) Ell., var. LAEVIGATUS T. & G. The stations for this variety at Isle au Haut and Deer Isle are northeastward extensions from Kennebec County.

EPILOBIUM ADENOCAULON Haussk., var. PERPLEXANS Trel. A collection at Hat Island near Swans Island is the first made in the state.

CORNUS CANADENSIS L., var. INTERMEDIA Farr. A bunchberry collected in dry soil on the sterile slopes of Mount Champlain on Isle au Haut proves to be this variety, which has been known in the East only from Labrador and western Newfoundland.

VACCINIUM ATROCOCCUM (Gray) Heller. This has hitherto been known from Orono and from Knox County southwestward. It is very abundant in a sphagnum bog at Brooklin and in several swamps on Deer Isle.

MERTENSIA MARITIMA (L.) S. F. Gray. Swans Island and Isle au Haut may be added to the list of stations for this plant in Norton's list. It is interesting to note that in this region at least, the plant occurs only on the outer islands on the more exposed headlands or beaches.

ACHILLEA LANULOSA Nutt. The Swans Island material is the first collection of this plant made in Maine.

YALE UNIVERSITY.

A NORTHERN VARIETY OF ASTER LINARIIFOLIUS.

M. L. FERNALD.

THE handsome rigid-leaved *Aster linariifolius* is found somewhat generally on arid or sterile, gravelly or sandy soils throughout the eastern United States, extending northward in the northeast to Lake Champlain, Vermont, Grafton County, New Hampshire and southern Somerset and Penobscot Counties in Maine; i. e. in New England its northern limit is at about latitude 45°, its eastern limit at the Penobscot Valley. North and east of this limit *Aster linariifolius* is extremely rare and much of the evidence of its occurrence is open to serious doubt, although it is listed in Macoun's *Catalogue* from three regions: "Newfoundland. (*Cormack.*) Nepisiquit River, N. B. Rather

rare. (*Fowler's Cat.*) Three Rivers, Q. (*Maclagan.*)," and in Hooker's *Flora Boreali-Americana* from "Canada. *Mrs. Sheppard.* Newfoundland. *Mr. Cormack.*" Beyond the *Cormack* record there is no other evidence of the plant from Newfoundland and in a detailed survey of Newfoundland botanical data Cormack's records have been found so generally untrustworthy that, without supporting evidence, this one can hardly be accepted as satisfactory. It is highly probable that Cormack had *Erigeron hyssopifolius* which is common along many of the Newfoundland rivers. Fowler's material from the Nepisiguit (or "Nepisiquit") River has not been seen but the locality as given by him, "Pabineau Falls," is highly suggestive of the typical habitat of *Erigeron hyssopifolius,* which is found on the ledges and gravels about the falls of nearly all rivers of the Gaspé Peninsula, northern New Brunswick and northern Maine. The Three Rivers record may with more probability be accepted for *A. linariifolius,* though it is highly desirable that the exact identity of the plant should be determined. But from these notes it is evident that north and east of New England there have been known few, if any, undoubted stations for *A. linariifolius.*

It is, therefore, interesting to find among the collections made in the Province of Quebec during the past summer by Brother Marie-Victorin of the Collège de Longueuil, Longueuil, Quebec, fine material of *Aster linariifolius* from the rocky banks of the River Ste. Anne at St. Raymond, Co. Portneuf, Quebec, somewhat northwest of the city of Quebec. Brother Victorin's material, although clearly belonging specifically with *A. linariifolius,* differs from the typical form of the plant in its less rigid and shorter oblong-linear mostly round-tipped ascending leaves and in having the oblong-linear obtuse bracts of the involucre more herbaceous than in typical *A. linariifolius.* It is a well pronounced geographic variety, with which it is a pleasure to associate the name of its discoverer, who is emulating Provancher and Brunet in making better known to his own people the flora of the Province of Quebec.

Whether the plant of Three Rivers, above referred to, is true *A. linariifolius* or the more northern variety is yet to be determined and this will not prove a difficult task; for, in writing of the plant from Ste. Anne River, Brother Victorin says:

"While travelling on the C. P. R. between Montreal and Quebec, I noticed that very likely this plant occupied an extensive tract of sandy

ground between Three Rivers and Champlain. It was then in full flower and I am quite convinced that it was *Aster linariifolius*."

The plant from the Ste. Anne River may be called

Aster linariifolius L., var. **Victorinii**, n. var., humilis 1–1.6 dm. altus; foliis adscendentibus vel patentibus confertis viridibus oblongo-linearibus, longioribus 1.3–1.8 cm. longis 2–4 mm. latis, apice rotundatis, margine ciliolatis; capitulis 1–6; involucris 8–10 mm. altis; squamis subherbaceis oblongo-linearibus ciliatis, apice rotundatis vel obtusis. Quebec: on rocky banks of River Ste. Anne, St. Raymond, Co. Portneuf, August, 1914, *Brother Marie-Victorin*, no. 618 (type in Gray Herb.).

Differing from typical *Aster linariifolius* in its more crowded mostly ascending greener and less rigid short round-tipped leaves and in the more herbaceous bracts, the outer oblong-linear. In typical *A. linariifolius* from New England southward and southwestward, the less crowded spreading or spreading-ascending linear or linear-spatulate leaves are rigid and more pointed, the larger leaves 2–4 cm. long, and at least the outer linear-lanceolate bracts of the involucre taper gradually to acute tips.

Gray Herbarium.

A FORM OF POTENTILLA TRIDENTATA.

Arthur Stanley Pease.

In a dry pasture about four and a half miles south of the village of West Milan, New Hampshire, I collected, on 20 August, 1912, plants of *Potentilla tridentata* Ait. which appear noteworthy from the rather abundant hirsuteness of both surfaces of the leaves. A comparison with material of this species in the Gray Herbarium and the Herbarium of the New England Botanical Club has disclosed other specimens showing, in greater or less degree, the same tendency. This peculiarity is not mentioned by Aiton in his brief description of the plant (a native of Newfoundland) introduced at Kew in 1776,[1] nor shown in

[1] Hort. Kew. (1789), ii, 216: "P. foliis ternatis cuneiformibus apice trifidis."

the plate accompanying the description.[1] Theodor Wolf, in his *Monographie der Gattung Potentilla* (1908), 77, records no variety or form of the species based upon any character connected with pubescence or hirsuteness. In the absence, therefore, of definite description by the author of *P. tridentata* or of later segregation, the hirsute-leaved plant, which, though apparently not separable geographically or in habitat from typical *P. tridentata*, yet seems to merit some recognition, may be described as

Potentilla tridentata Ait., forma **hirsutifolia** n. f., foliis utrimque hirsutioribus.—Quebec: Paspebiac lighthouse, 27 July, 1902, *Williams & Fernald;* vicinity of Cap à l'Aigle, 18 July, 1905, *J. Macoun,* no. 67050 (the sheet in the Gray Herbarium containing three plants of the form and two of typical *P. tridentata*). Maine: Orono, 1880, *K. Furbish;* Summit of Mt. Battie, Camden, 1325 ft., 14 July, 1903, *K. Furbish;* Bar Harbor, *F. H. Peabody;* Southport, 7 Aug., 1894, *M. L. Fernald.* New Hampshire: Dry pasture 4½ miles south of W. Milan village, Milan, 20 Aug., 1912, *A. S. Pease,* no. 13871 (type, deposited in Herbarium of the N. E. Botanical Club). Massachusetts: Eastern Point, Gloucester, 7 June, 1896, *E. L. Rand & B. L. Robinson;* Princeton, July, 1893, *C. A. Regester.*

Specimens from Orland, Maine, collected by Helen G. Atkins, and Norfolk, Connecticut, collected 27 June, 1906, by C. H. Bissell, show a transitional tendency from typical *P. tridentata* toward this form.

Urbana, Illinois.

[1] Plate 9. The problematical *P. retusa* O. F. Müller, *Fl. Dan.* V. fasc. 14 (1780) 4, t. 799, described from Greenland, is referred by Willdenow, *Spec. plant.* ed. 4 (1797) ii. 1110, and by other authors, including Wolf, to *P. tridentata* Ait. If this identification were undoubted, the name *P. retusa* would supplant the later *P. tridentata* and would be applicable to the hirsute form here under discussion, for *P. retusa* was described "foliis ternatis, hirtis, apice retuso, tridentato." The original plate, however, shows it to have had broadly obovate bright yellow petals, a character which at once throws doubt upon its identity with the narrower- and white-petaled *P. tridentata.*

TWO NEWFOUNDLAND ANTENNARIAS.

M. L. Fernald.

During the middle of July last, while the number of Rhodora [1] containing descriptions of several Antennarias from Newfoundland was in press, Mr. Harold St. John and the writer had an opportunity to spend a couple of days about Port à Port Bay in western Newfoundland. Practically all of our time was devoted to the limestone tableland, Table Mountain, which rises to the slight elevation of 300 m. above the Bay. Here the two abundant representatives of *Antennaria* were *A. eucosma* Fernald & Wiegand, which was widespread in the turf and humus, and *A. alpina*, var. *cana* Fernald & Wiegand, which abounded on the dry limestone shingle. On one dome of the tableland the plant recently proposed as *A. canadensis*, var. *spathulata* Fernald [2] was in prime development wherever the dry shingle was covered with turf; and on another dome (the northernmost visited) the characteristic *Antennaria* of the shingly barrens was a little whitish plant strongly suggesting *A. alpina*, var. *cana*, but with much smaller heads and milk-white, instead of blackish, involucres. The latter plant is quite unlike any species described from eastern America and clearly distinct from its nearest relative, *A. subviscosa* Fernald, of Rimouski County, Quebec.

Heretofore the only herbarium material of *A. canadensis*, var. *spathulata* has been the three collections cited under the original description, two of them August specimens with shriveled inflorescences, the other a single flowering individual. On Table Mountain the plant was in beautiful flower and an abundance of material was secured which agrees perfectly with the earlier collections and indicates that the plant has strong specific characters to separate it from *A. canadensis* Greene, a species unknown from Newfoundland.

The two species here noted may be called

Antennaria **spathulata** (Fernald), n. comb. *A. canadensis*, var. *spathulata* Fernald, Rhodora, xvi. 132 (1914).

Differing constantly from *A. canadensis* Greene not only in the cuneate-spatulate round-tipped basal leaves originally emphasized but in several other characters. In *A. canadensis* the assurgent

[1] Rhodora, xvi. no. 187, July, 1914.
[2] Fernald, Rhodora, l. c. 132 (1914).

stolons are numerous and the mats often several decimeters across; in *A. spathulata* the stolons are very few and mats 1 dm. across are rare. In *A. canadensis* the mature flowering stem is 3–5 dm. high, with 8–15 cauline leaves and very loose several-headed corymbs; in *A. spathulata* the mature flowering stems are 0.8–2 dm. high, with 4–7 cauline leaves and dense glomerules of 2–5 heads. Besides the material cited the following should be noted as much more fully representing this endemic Newfoundland species: humus and turf on the limestone tableland, altitude 200–300 m., Table Mountain, Port à Port Bay, July 16 & 17, 1914, *Fernald & St. John*, no. 10,870.

A. **albicans**, n. sp., planta humifusa, stolonibus foliosis perbrevibus (ad 2 cm. longis); foliis basilaribus spathulatis subacutis vel obtusis vix mucronatis 3–8 mm. longis 2–3 mm. latis supra albidis, tomento denso minuto sublucidoque; caule florifero 4.5–9 cm. alto gracile subremote folioso; foliis caulinis 9–15 linearibus 6–12 mm. longis 1–2 mm. latis, mediis attenuatis apice subulato, superioribus apice scarioso glabro lineari 2–2.5 mm. longo; capitulis femineis (1–)2–5 glomerulatis turbinato-campanulatis; involucro 4.5–6 mm. alto 4.5-6 mm. lato (in specimine siccato); bracteis 2–3-seriatis subaequalibus, exterioribus 3–4 mm. longis oblongis vel lanceolatis obtusis vel subacutis stramineis vel brunneis basi virescentibus paulo lanatis, interioribus oblongis obtusis erosis lacteis.

Plant humifuse, the leafy stolons very short (up to 2 cm. long): basal leaves spatulate, subacute or obtuse, scarcely mucronate, 3–8 mm. long, 2–3 mm. wide, white above with dense minute somewhat shining tomentum: flowering stem 4.5–9 cm. high, slender, somewhat remotely leafy: cauline leaves 9–15, linear, 6–12 mm. long, 1–2 mm. wide; the median attenuate, subulate at tip; the upper with a glabrous linear scarious tip 2–2.5 mm. long: pistillate heads (1–)2–5 in glomerules, turbinate-campanulate: involucre 4.5–6 mm. high, 4.5–6 mm. wide (in dried specimen): bracts in 2–3 series, subequal: the outer 3–4 mm. long, oblong or lanceolate, obtuse or subacute, straw-colored or brown, green and a little lanate at base; interior oblong obtuse, erose, milk-white.— NEWFOUNDLAND: dry limestone shingle on one of the northern domes of Table Mountain, Port à Port Bay, July 16 & 17, 1914, *Fernald & St. John*, no. 10,869 (TYPE in Gray Herb.).

Nearly related to *A. subviscosa* Fernald, RHODORA, xvi. 131 (1914), but that species has very long subligneous freely branching bases, the basal leaves with much looser dull tomentum, the scarious appendages of the upper cauline leaves very pubescent, the upper leaves and the inflorescence glandular, and the inner bracts of the involucre narrow and acute.

GRAY HERBARIUM.

The twentieth annual field Meeting of the Vermont Botanical Club was held at Fairhaven, Thursday, Friday and Saturday, July 9, 10 and 11, 1914. Headquarters were at Hotel Allen which sets an unexcelled table. Thursday forenoon was spent near the village on some of the hills of slate rock and at a small place owned by Mr. Ellis, one of the members, who is trying out a great many plants of economic value — fruits, nuts, berries, etc., some of which were the black walnut, fig, olive, a *Physalis* which makes a delicious preserve sampled by the Club, an *Amelanchier* with specially fine fruit, various garden herbs, etc.

The afternoon was spent in a cedar swamp, where, besides the usual plants of such places, the swamp valerian, *Valeriana uliginosa*, and some hybrid ferns were found. *Calypso borealis*, however, was sought in vain.

Friday was spent at West Haven about the ponds and cliffs of that region. At the ponds were found, among other things, the water star-grass *Heteranthera dubia* and on the cliffs grew luxuriant specimens of the purple cliff brake, *Pellaea atropurpurea*, the slender cliff brake, *Cryptogramma Stelleri*, the wall rue spleenwort, *Asplenium Ruta-muraria* and the maiden-hair spleenwort, *Asplenium Trichomanes*. Special attention was paid to the blackberries on all the trips.

Carver's Falls on the Poultney River was to have been the objective point Saturday morning but lack of water owing to drought and a new dam made conditions unfavorable and instead several of the members took a side trip to Lake Bomoseen on their way back to Rutland.

There was a very good attendance — thirty members being present. The weather was perfect and the meeting proved both instructive and enjoyable.— Nellie F. Flynn, Burlington, Vermont.

The Cambridge British Flora.— The first volume of the long-awaited Cambridge British Flora [1] has come to hand. It is in reality Volume II; and as a forerunner of the others of the series is of unusual interest to American botanists since, of the recognized British species discussed and illustrated (about 130) in the groups covered — *Salicaceae* to *Chenopodiaceae* — two-thirds are members of our own flora as

[1] The Cambridge British Flora by C. E. Moss, D. Sc., F. L. S. assisted by specialists in certain genera. Illustrated from drawings by E. W. Hunnybun. Vol. II. Salicaceae to Chenopodiaceae, small folio, pp. xx + 206, with text-maps and 206 plates. Cambridge (England) and New York; The Macmillan Co. 1914. $12.50 net.

well. In presswork, paper and binding the book is dignified and sumptuous, as would be expected from the Cambridge University Press. In arrangement the work comes to date and, the Introduction tells us, is the first British flora based upon the system of Engler & Prantl. In nomenclature the international rules adopted at Vienna and Brussels are followed as are the international recommendations of groups to be recognized (species, variety, forma, etc.); but with occasional intentional departures from the nomenclatorial rules and recommendations such as many authors feel it incumbent upon themselves to make, although by so doing they defer the day of stability in our nomenclature.

The text is very full and is accompanied by text-maps showing the distribution of each species in the British Isles, and each accepted species is illustrated by a full-page line-drawing plate. When compared with the excellence of the text, the plates are disappointing for, although faithful in outlines, they fail to catch much of the "gesture" of the plant, and in many cases they do not bring out clearly the technical diagnostic characters which a critical student is anxious to see. It is furthermore probable that the desired contrasts would be better emphasized if some of the closely related species could be illustrated on one plate; and at the same time, the plates would, in many cases, give less the impression of occupying needless space. For instance, everyone who has studied intensively our annual species of *Salicornia* is interested in Dr. Moss's attempts to segregate them and would be greatly aided in understanding the proposed species if diagnostic figures could be seen side-by-side; but in the Cambridge British Flora each species, however small the plant, is given a full plate, with the result that 100 sq. dm. of plate-paper are used to bring out the figures (not entirely convincing) of the annual species of *Salicornia*, which in the aggregate occupy only 25 sq. dm. of space.

In the recognition of species the Introduction states that "a middle course is desirable." Probably all of us, however radical, will readily subscribe to this ideal; the difficulty is clearly to see and to follow the "middle course." In many of the technical groups — the *Salicaceae*, *Betulaceae* and *Polygonaceae*, for example — the treatments are obviously guided by this precept and systematists throughout the northern hemisphere will find much in the elaboration of these families that will be directly serviceable or at least suggestive in the working out of their own local problems. But it will require a much-altered conception of specific values to accept without question all the "species" recognized in the *Atriplex patula* series or in *Salicornia*. For example, it is not clear to the uninitiated that in *Salicornia* such diagnostic statements as the following are indicative of distinct species:—

"5. **S. pusilla** (p. 193). *Stem* erect, up to about 1·0 to 1·5 dm. high, branches curved-ascending. *Terminal spikes* short, up to about 5–12 mm. long, with about 2–4 flowering segments. *Lateral flowers* smaller than the central one. *Stamens* 1.

6. **S. gracillima** (p. 193). *Stem* erect, up to about 1·0 to 1·5, rarely 2·0 dm. high; branches regular, all or all except the lowest ones short (up to about 2·0–2·5 cm. long), subequal, parallel. *Terminal spikes* short (up to about 8–12 mm. long), stout, with 2–4 flowering segments. *Lateral flowers* smaller than the central one. *Stamens* 1."

S. pusilla and *S. gracillima* may possibly have specific or varietal characters, but neither the above-quoted portion of the conspectus nor the fuller descriptions nor the illustrations bring them out. In this connection it is illuminating to read in the Introduction that "We do not furnish any analytical or artificial keys to the groups of plants. These keys are scarcely ever satisfactory." Surely, however, a key could be provided which would bring out more clearly the *specific* differences, if they exist, in the annual Salicornias; or, if it is not possible to "key" the plants, they certainly do not deserve the exalted rank of species.

These criticisms are written in all friendliness and, frankly, from a sense of some disappointment; for the reviewer, who is confronted by many of the problems which have perplexed British botanists, had set an imaginary standard for the new Flora and had looked forward to its settling many of his own difficulties. That it does not in all details meet precisely this preconception is, of course, natural. It is an important and in some ways a great book; and everyone who wishes to keep abreast with the recent British work upon a flora in many features identical with our own will await expectantly the volumes as they come from the press.— M. L. F.

Vol. 16, no. 190, including pages 169 to 184, was issued 23 November, 1914.

Rhodora

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NOTES ON THE FLORA OF MARYLAND AND VIRGINIA,—II.

Ivar Tidestrom.

Five species of poplars are listed for Maryland in a recent work.[1] In a booklet[2] covering a part of the Amentiferae (Salicaceae, Ceriferae, and Betulaceae) nine species were listed, of which five have been introduced and four are native. It is to be noted that Elysium Marianum purports to include Virginia also, but since all of the species are found within the limits of Maryland, the wide difference between the accounts of the poplars from the latter state should not be passed over without some explanation. The lists given in Plant Life of Maryland include the following species: *Populus alba, P. heterophylla, P. grandidentata, P. tremuloides,* and *P. dilatata.*

Populus alba is found escaped in many places throughout the region, as is also the closely related *P. canescens.* The two species are readily distinguished both by the flowers and the leaves. The following diagnoses are given of the staminate aments of the two species:

P. alba. Stam. aments fullgrown, 8–10 cm. long, 1.5 cm. in diameter: subtending floral bracts villous, rounded with a cuneate base; light brown, 6 mm. long (incl. the stipe), 3 mm. wide, laciniately cleft into 5 or more teeth: staminiferous disk (on a stalk 1 mm. long) elliptic, about 2 mm. long, 1.5 mm. wide: stamens about 8; anthers red, 0.7 mm. long: pollen-grains spherical, almost smooth.

P. canescens. Stam. aments fullgrown, about 9 cm. long, 2 cm. in diameter: subtending floral bracts villous, rounded with a cuneate base, russet brown, 4 mm. broad, 7 mm. long (incl. the whitish stipe),

[1] Plant Life of Maryland, p. 422.
[2] Elysium Marianum 3: 11, 1910.

laciniately cleft into 5 or more teeth: staminiferous disk (on a stalk 2 mm. long) elliptic, about 3 mm. long, 2 mm. broad: stamens 12–16; anthers red, 1 mm. long: pollen-grains almost smooth, somewhat larger than in *P. alba*.

Comparing the descriptions we find several factors which do not agree, particularly the number of stamens. In general the floral parts in *P. canescens* exceed in size those of *P. alba*. Those who are in position to observe the two species in the same locality will soon learn to distinguish them in flower. The leaves of the young growth and root-shoots of *P. alba* are more or less deeply lobed, while in *P. canescens* they are merely toothed, or at the most shallowly lobed. Both are known to send out innumerable root-shoots.

Populus canescens should be included in the list of introduced trees that have become established in many places. I have not observed it in the North and specimens, collected in New England southward to Pennsylvania, belonging to the *P. alba* group, which have come to my notice, have invariably been *P. alba*.

Populus alba Bolleana. This handsome fastigiate form is found in cultivation in our region, but not escaped so far as I have been able to ascertain. Its floral characters differ somewhat from those of *P. alba*. Stam. aments, fullgrown, about 6 cm. long, 1 cm. or less in diameter: subtending floral bracts villous, rounded with a cuneate stalk equalling the blade; the latter dark brown below, lighter brown towards the apex, cleft into 4 nearly equal teeth: staminiferous disk (on a stalk 1 mm. long) elliptic about 2 mm. long, 1.5 mm. wide: stamens 8; anthers red, 1 mm. long.

Populus grandidentata. This species was first recorded from Canada by Michaux Sr., and the diagnosis by Richard reads:

"P. petiolis superne compressis; foliis subrotundo-ovalibus, acuminatis, utrinque glabris, inaequaliter sinuato-grandi-dentatis.
Obs. Affinis P. albae; foliis itidem quandoque basi biglandulosis.
Hab. in Canada." [L. C. Rich. in] Michx. Fl. Bor. Am. **2**: 243, 1803.

Later Michaux Jr.[1] in his illustrated account of the trees of North America gives us additional information about it so as to leave us in no doubt as to its identity.

Prior to 1806 Muhlenberg communicated specimens (?) of a poplar

[1] Hist. des Arbres For. de l'Amér. Sept. 1812–13.

to Willdenow which he called *P. trepida*. The latter published it under that name in 1806.[1] His description is applicable to *P. grandidentata* and to no other. Moreover, Muhlenberg[2] later on refers *P. grandidentata* to *P. trepida*. This was discussed by the writer in the American Midland Naturalist **2**: 13. 1911.

On July 5, while I was botanizing between Oakland and Thayerville, Garrett Co., Maryland, another poplar came to my notice.

Fig. 1.

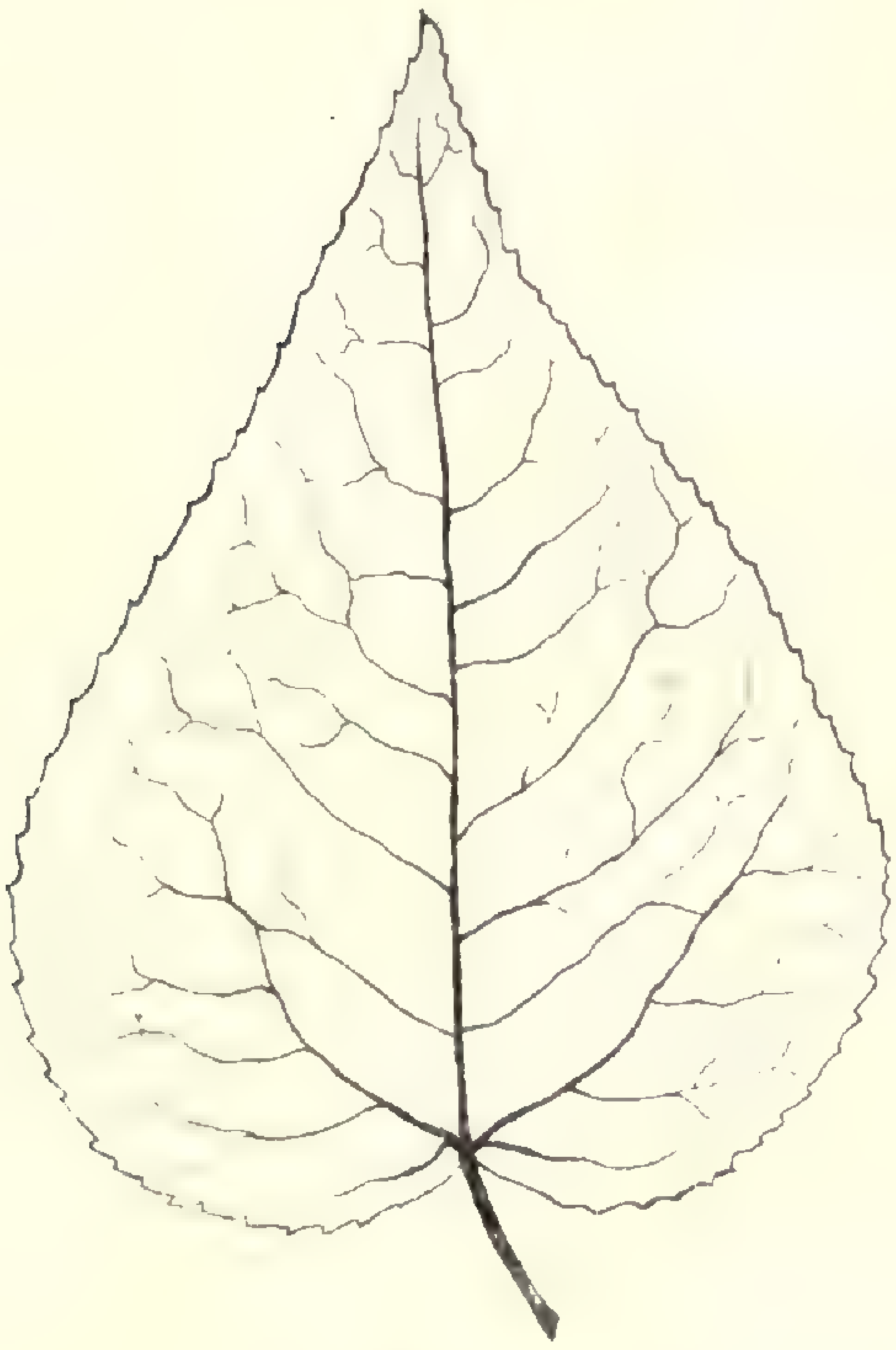

Fig. 2.

Fig. 3.

Fig. 1. Populus grandidentata f. septentrionalis. × ⅓.
Fig. 2. Populus grandidentata f. septentrionalis. × ½.
Fig. 3. Populus grandidentata f. meridionalis. × ⅓.

It resembled much *P. tremula* at a distance but proved to be a form of *P. grandidentata*. I was convinced at the time that the latter species has a wide range of variation in the form and size of its leaves. There appear to be three distinct forms of normal leaves — two of which may sometimes occur on the same tree, if not on the same branch.

[1] Willd. Sp. Pl. **4**: 803, 1806.
[2] Muhl. Catalogue 92, 1813.

The illustration given by Michaux Jr. shows a leaf-blade as broad as long. In Maryland another type seems to prevail having an outline recalling the leaf of *Betula nigra*. Dr. E. L. Greene has collected specimens (f. 1) near Springfield, Nova Scotia, which show the first type. The corresponding root-shoot leaf (f. 2) differs from the ordinary root-shoot leaf by its attenuate apex (cf. ff. 2, 4). The leaves of the young growth of our Maryland form are well illustrated in figures 3 and 4, the latter figure representing a leaf with a blade 20 cm. in length.

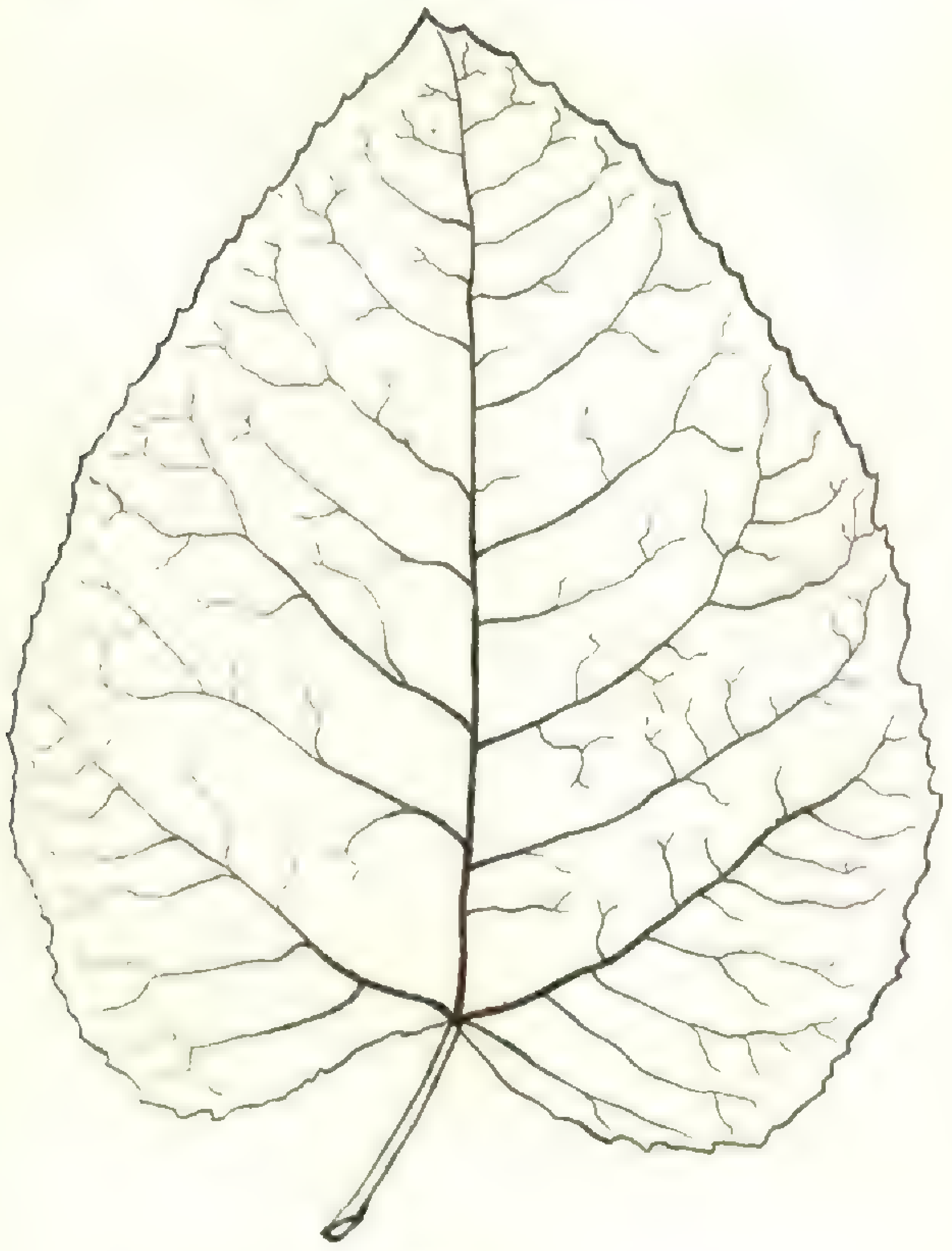

Fig. 4.

Fig. 5.

Fig. 4. Populus grandidentata f. meridionalis. × ½.
Fig. 5. Populus grandidentata f. coelestina. × ½.

The type of leaf of the poplar found in Garrett County deviates much from that of the others.

The leaves of this form are thinner: their outline commonly subrotund: the apex is not at all prominent, sometimes rounded so as to make the leaf outline elliptical: the margin is repand or remotely repand-dentate, and not prominently repand-dentate or serrate.

The forms may be distinguished thus:

1. Populus grandidentata (ff. 1–5).
   α. **septentrionalis** (ff. 1, 2): folia ramorum rotundata pauce repande grandidentata, apice triangulare; surculorum cordata inaequaliter serrata, acuminata, subtus plus minusve tomentosa vel canescentia.
   Canada and New England.
   β. **meridionalis** (ff. 3–4): folia ramorum elliptica (forma fol. *Betulae nigrae*) repande grandidentata, apice triangulare; surculorum cordata inaequaliter serrata, apice triangulare, repande grandidentata, subtus plus minusve tomentosa vel glabrescentia.
   New England and southward.
   γ. **coelestina** (f. 5): folia ramorum rotundata vel elliptica, apice triangulari obtuso vel rotundato, margine repando.
   Mountains of Maryland. [Tm. 6449.]

Populus heterophylla. This species is said to be rare. I have observed it eight miles northeast of Pocomoke City, Worcester Co., Maryland, where it grows much scattered among other deciduous trees and *Chamaecyparis thyoides*. The tree is usually tall and straight, the branches and leaves being sometimes inaccessible. My specimens [Tm. 5435] were gathered from root-shoots. Mr. H. H. Bartlett has collected it at Sandy Landing, on the Potomac River some 17 miles west of Washington.

Populus tremuloides. This species has been listed for Maryland.[1] It is not, however, recorded from the region immediately south of Pennsylvania in any of our recent manuals.[2]

No specimens from Maryland have ever come to my notice, nor have I ever seen any trees in places where I might suspect its presence. Supposed specimens from Thayerville, Garrett County, Md., are not of this species. On my recent visit to the latter place as stated above, I found no trace of *Populus tremuloides*, but in its stead *P. grandidentata* f. *coelestina*, which latter has a deceiving "*P. tremula* aspect" from a distance. It should be remembered that Western Maryland is a little explored region botanically and that there are hundreds of square kilometers of forest area as yet unexplored. That we might find it there is not at all unlikely, since other trees and shrubs with which it is usually associated are present in Garrett County. I have observed *Populus tremuloides* on Pocono Plateau, Pa., [Tm.

[1] Plant Life of Maryland, p. 423.
[2] Sargent, Man. of Trees of N. Am. p. 155, 1905.
Gray's Manual, p. 328, 1908.
Britton & Brown, Ill. Fl. **1**: 590, 1913.

6551–53] where it forms dense growths in places. Along with the typical form I observed also *P. tremuloides β. Davisiana* [1] [Tm. 6554] hitherto only known from Richmond, Ohio.

Since the publication of this form Prof. C. A. Davis, its discoverer, has collected it at Wenham, Mass. It is readily distinguished by its large, sub-orbicular, 6–9 cm. long leaves and by its equally long, coarse, flattened petioles. Professor Davis has also discovered another very interesting form on Mount Riga, near Salisbury, Conn., for which the following diagnosis is proposed:

Populus tremuloides γ **reniformis**.

Differt a forma typica foliis late reniformibus, abrupte apiculatis margine repando serrato.

Type in U. S. Dept. Agr. Economic Herbarium.

Collected on Mount Riga, Conn., June 2, 1912.

This form is readily distinguished by its kidney-shaped leaves, which are ordinarily about 5–6 cm. in length (including the abrupt point) and 7–8 cm. in width.

There is great difference of opinion as to the limitation of *Populus tremuloides.* According to some the concept of the species embraces all the forms from Newfoundland to Mexico and Lower California. Others again regard it as a composite species, some of the constituents of which merit specific or at least varietal rank. The Rocky Mountain form [2] was segregated from the Eastern upon floral character mainly. The autumn coloring of the leaves differs much in the two forms, the one turning into a golden varying into orange, the other becoming pale lemon yellow.

With the exception of the introduced *Populus dilatata* [*P. italica*] the Lombardy Poplar, nothing is said about our native species of Black Poplars (Cottonwoods) by the Maryland botanists, although ample material exists in the U. S. National Herbarium. The late Professor Ward recorded "*Populus monilifera*" (*P. virginiana*) long since from the Potomac Valley, and the writer has observed it upstream as far as Cumberland, Md.

The writer [3] has also treated the two "old" species of black poplars (cottonwoods) which we have in Maryland and Virginia and has separated them on both floral and leaf characters. Since that time

[1] Amer. Midl. Nat. **2**: 15, 1911.
[2] *Populus aurea* Tm. Am. Midl. Nat. **2**: 15, ff. 3, 4, 1911.
[3] Rhodora **13**: 195, 1911.

I have observed the true Carolina poplar "*P. angulata*" in its native region along the Savannah River opposite Augusta, Ga.

Since Michaux, Jr. recorded the species from the Lower Virginia we are justified in discussing it in this paper.

It is difficult to interpret the few lines of description given by Marshall [1] of his "*Populus deltoide.*" The description of the leaves might fit any one of the forms now grouped under "*P. deltoides.*"

Fig. 6.

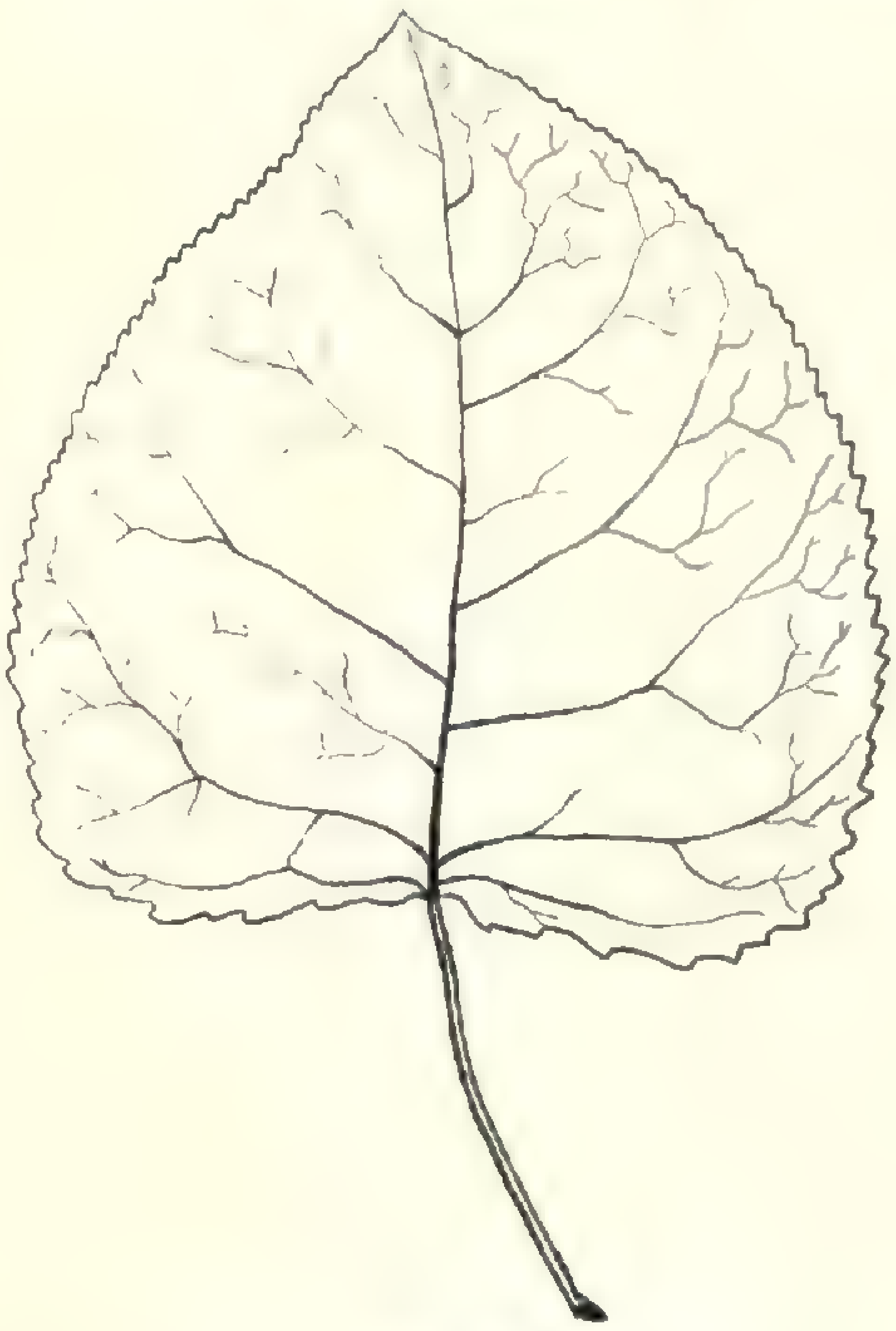

Fig. 7.

Fig. 6. Populus virginiana. $\times \frac{1}{2}$.
Fig. 7. Populus virginiana. $\times \frac{1}{2}$.

But his statement "It grows naturally upon rich low lands, on the banks of large rivers in Carolina and Florida" would compel us to apply the name to *P. angulata* Ait., if we could be sure of its being the only species of the Aigeiros group in the South. In my own treatment of the black poplars I have applied the name *P. deltoides* to the tree which the Philadelphia botanists of a century or more ago were wont to see in their native region. Marshall (l. c.) mentions also *P. nigra*, the black poplar. His description of this tree would indicate that he had the true *P. nigra* in hand for he states that the leaves of it are "a little downy underneath," a condition which does not exist

[1] Arbustrum Americanum (originally from Bartram's Catalogue).

in the "*P. deltoides*" of the Delaware country. The latter is commonly planted in or about Washington where I have observed it, and its leaves when unfolding are invariably glabrous and shining. Through the courtesy of Prof. B. L. Robinson I have been able to study material of the true *P. nigra* of Europe. Typical leaves of the latter are generally rhombic-acuminate. There is, however, a wide range of variation of the leaves of the two species and some forms of both are nearly identical in outline. The pubescence, however, even in full grown leaves, serves to distinguish the Old World species from our own.

Fig. 8.

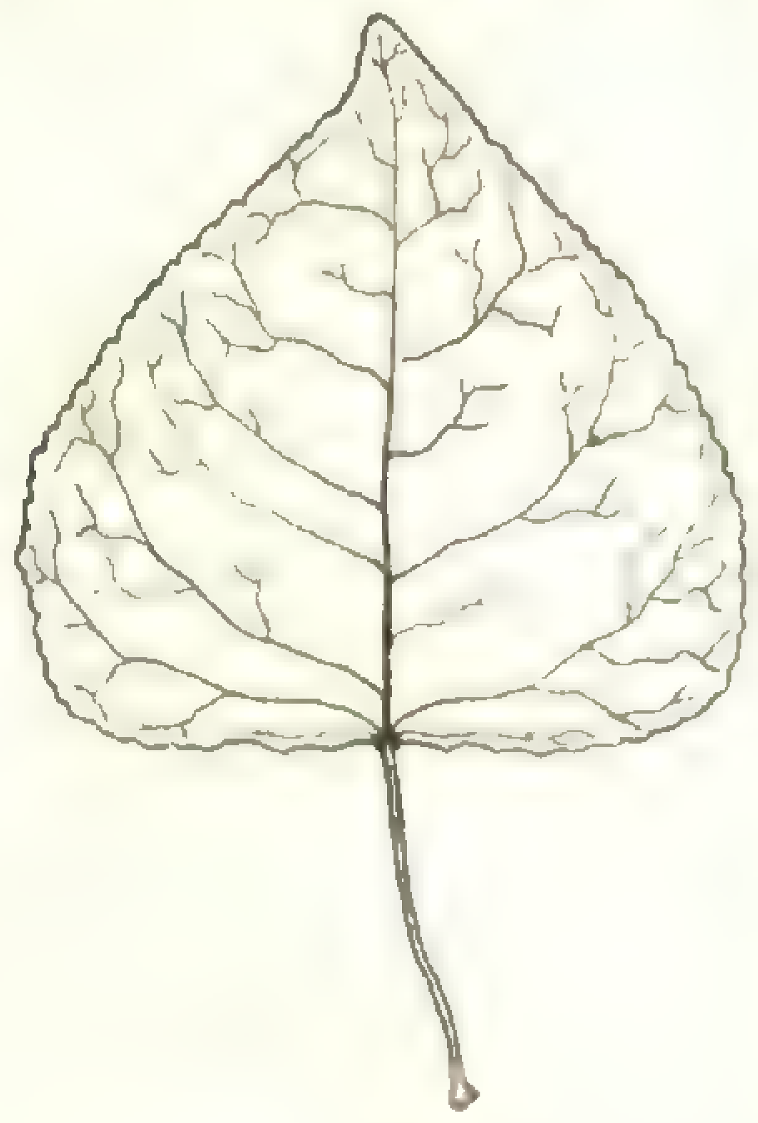

Fig. 9.

Fig. 8. Populus deltoides. × ½.
Fig. 9. Populus deltoides. × ½.

Synopsis of the Species (Sect. Aigeiros).

Leaves of a cordate type.

Populus virginiana Fouger (ff. 6–7). Normal leaves (excl. petiole) 8–10 cm. long and nearly as broad, ciliolate; the base varying from nearly truncate to cordate (f. 6.): rootshoot leaves larger (f. 7.): stamens 30–50; anthers yellow (reddish at first). Fl. Apr.–May. Along Potomac River.

Leaves of a deltoid or ovate type.

Leaves predominantly deltoid.

Populus deltoides Marsh. (ff. 8–10). Normal leaves (excl. petiole) 8–10 cm. long and nearly as broad (ff. 8 and 10): root shoot leaves larger, 12–15 cm. long and nearly as broad (f. 9): stamens 30–50; anthers dark red. Fl. March–April. Along Delaware River. In cultivation.

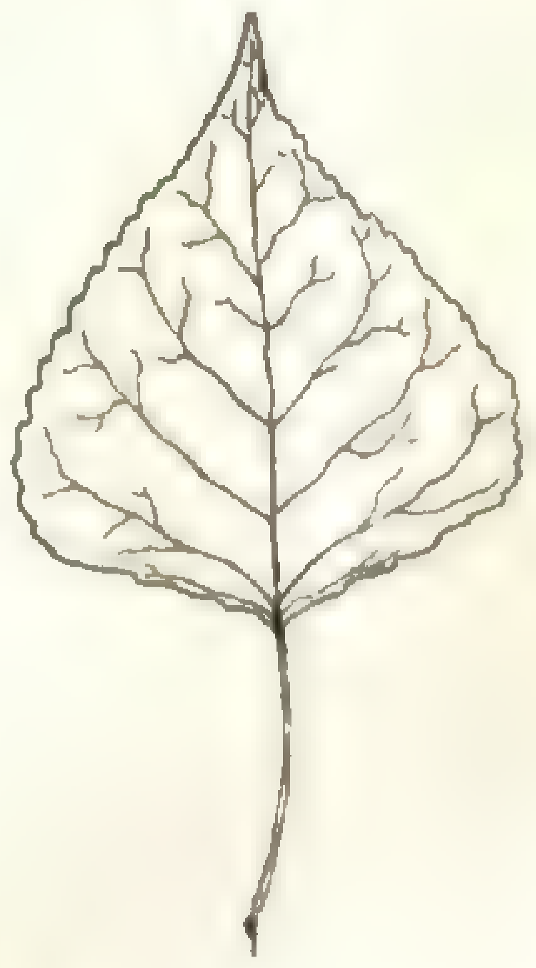

Fig. 10. Populus deltoides. × ½.

Leaves predominantly ovate.

Populus angulata Ait. Hort. Kew. **3**: 407. 1789. Michx. f. Hist. Arb. **3**: 302. t. 12, 1813. Schneider, Ill. Handb. **1**: 9. f. 1, 0–p, 1904 (ff. 11–13.) Normal leaves (excl. petiole) 8–10 cm. long, nearly as broad; the base varying from rounded to nearly truncate (f. 12): rootshoot leaves 12–18 cm. long, 12–15 cm. broad; the base rounded: flowers unknown. The young branches are of an olive brown color, 5-winged (See Michx. f., l. c. t. 12.), with scat-

tered, oblong, 1 mm. long, white lenticels. There is another type of leaves (f. 13) present on the young growth which I have not observed in the other species. In the latter form the serrations are much finer.

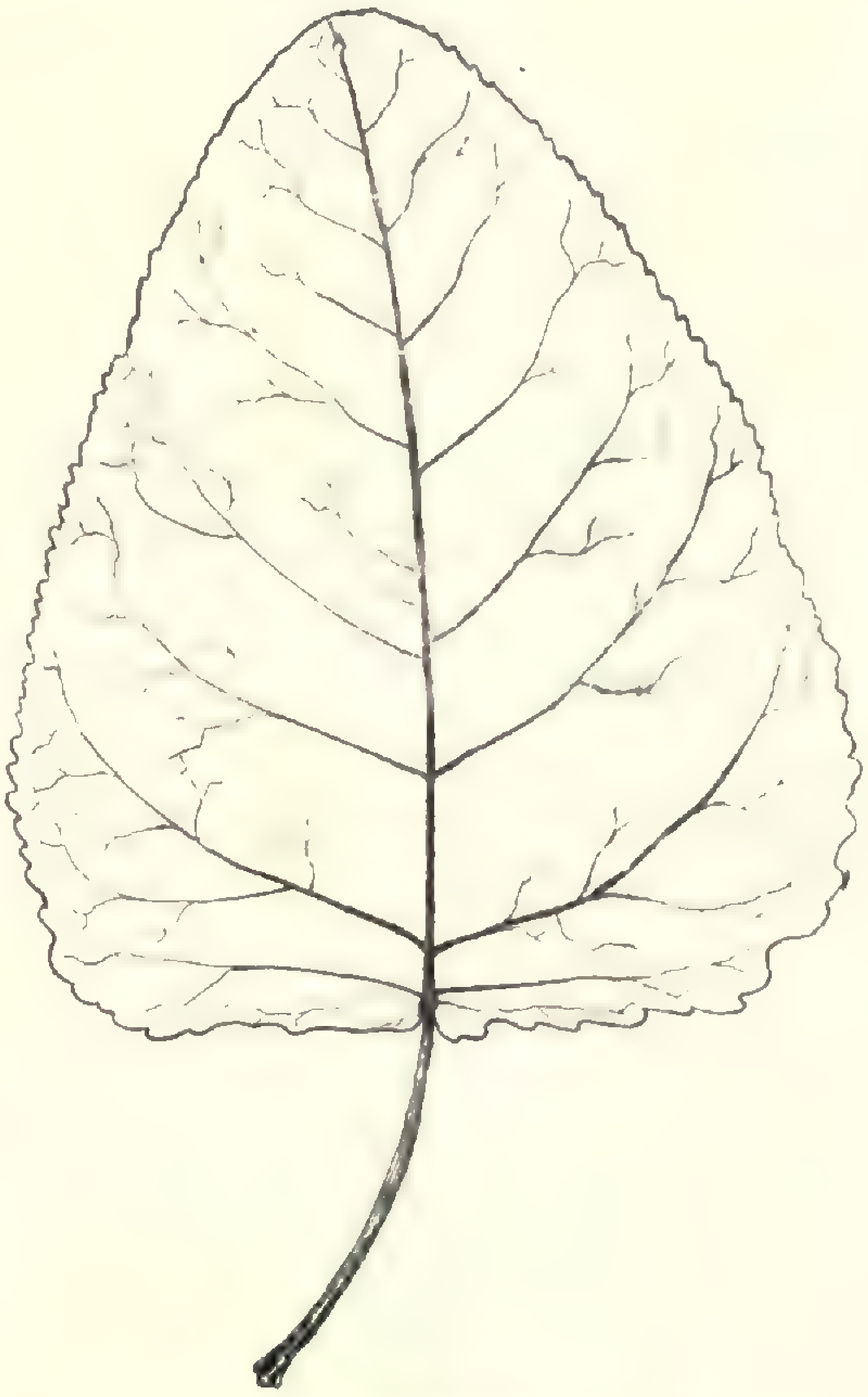

Fig. 11. Populus angulata. × ½.

Philip Miller observed as early as in 1759 that the Carolina Poplar was less able to resist cold than the other species of that group. Professor Bessey has also called attention to this fact.

Michaux f. in his description of the tree states: "Le bois du Peuplier de Caroline est blanc et très-tendre; on n'en fait aucun usage dans les pays oû il croît. Ce bel arbre a été introduit depuis long-temps en Europe, ou les Amateurs de cultures étrangères l'employent avec raison pour l'ornement de leur residence champêtre: seulement il a un inconvenient, c'est que, dans quelques hivers rigoureux, sous le climat de Paris, ses pousses terminales sont attaquées par les gelées." (Michx. f., l. c.) It was my good fortune to observe this handsome tree of our Southland last fall (Sept. 23, 1913). *Populus deltoides* which was planted in the streets had already shed its leaves while the native tree graced the banks of Savannah River in all its glory.

Fig. 12.

Fig. 13.

Fig. 12. Populus angulata. × ½.
Fig. 13. Populus angulata. × ½.

I am indebted to Albert F. Stouffer for the illustrations.

Washington, D. C.

THE WESTERN VARIETY OF MAIANTHEMUM CANADENSE.

M. L. Fernald.

The conventional descriptions of *Maianthemum canadense* Desf. in our manuals read: "Pubescent or glabrous"[1] or "Glabrous or pubescent,"[2] and a somewhat similar statement can be traced through the writings of various authors as far back at least as Hooker, who, writing of the plant of British America ("Newfoundland to the Rocky Mountains"), said "More or less downy or glabrous."[3] Prior to Hooker, however, the students of American botany, dealing chiefly with the plants of the Appalachian district, had described our plant as glabrous. Thus Pursh, who studied the plant sufficiently to distinguish two varieties based upon leaf-outline, said "foliis . . . . utrinque glaberrimis"[4] and Torrey wrote "leaves . . . . very smooth on both sides."[5] The latter descriptions, by botanists who knew the plants of the Appalachian region, exactly agree with the original diagnosis of *Maianthemum canadense* by Desfontaines: "foliis . . . . utrinque glaberrimis,"[6] and they perfectly describe the plant which occurs from Labrador to North Carolina, Tennessee, Indiana, Michigan and eastern Ontario. A study of nearly two hundred collections of the plant has failed to reveal a single pubescent specimen within the area above defined; while west of Indiana, Michigan and adjacent Ontario the plant is pilose upon the stem, rhachis and leaves (at least beneath). The only exception thus far seen is glabrous material on a mixed sheet from Brown County, Wisconsin; but with this single exception all the specimens seen from western Ontario, Manitoba, Saskatchewan and Alberta, southward to South Dakota, Iowa and Illinois are pubescent. Study of the flowers has failed to reveal any differences in them and in outline the foliage of the western pubescent plant closely simulates

[1] Watson & Coulter in Gray, Man. ed. 6, 526 (1890); Robinson & Fernald in Gray, Man. ed. 7, 291 (1908).

[2] Britton in Britton & Brown, Ill. Fl. i. 431 (1896), ed. 2, 517 (1913) under *Unifolium canadense*.

[3] Hook. Fl. Bor. Am. ii. 176 (1839) under *Smilacina bifolia*.

[4] Pursh, Fl. Am. Sept. i, 233 (1814) under *Smilacina canadensis*.

[5] Torr. Fl. No. & Mid. U. S. i. 353 (1824) under *Convallaria bifolia*.

[6] Desf. Ann. Mus. Paris, ix. 54 (1807).

that of the eastern glabrous type; but in its pubescence the western plant is so clearly distinguishable that it is worthy separation as a geographic variety which may be called

Maianthemum canadense Desf., var. **interius**, n. var., plus minusve pilosum.—Ontario: Mungo Park Point, Lake Nipigon, 1912, *H. E. Pulling.* Manitoba: Lake Winnipeg, *Richardson;* Observation Point, Lake Winnipeg, July 23, 1884, *J. Macoun;* Winnipeg Valley, 1859, *Bourgeau.* Saskatchewan: Carleton House to Cumberland House, July, 1827, *Drummond.* Alberta: Strathcona, June 21, 1903, *M. A. Barber,* no. 189. South Dakota: Piedmont and Little Elk Creek, alt. 4000 ft., June 27, 1892, *Rydberg,* no. 1043 (type in Gray Herb.). Iowa: Fayette, May, 1894, *B. Fink.* Wisconsin: Brown County, June 22, 1892, *J. H. Schuette.* Illinois: Fountaindale, Winnebago County, 1870, "a *rare* plant with us," *M. S. Bebb;* Starved Rock, La Salle County, June, 1909, *Greenman, Lansing, & Dixon,* no. 34; Lake Villa, August 3, 1906, *Gleason & Shobe,* no. 103; Chicago, *H. A. Warne.*

Gray Herbarium.

THE NORTH AMERICAN VARIATIONS OF ARCTOSTAPHYLOS UVA-URSI.

M. L. Fernald and J. Francis Macbride.

Arctostaphylos Uva-ursi, as it occurs in North America, seems to fall into three somewhat pronounced geographic variants differing primarily in the pubescence of the branches. The shrub which most clearly matches the European material has the very young branchlets minutely tomentulose and commonly somewhat viscid, but soon loses its pubescence. This typical form of the species is less common in North America than one of the others, but occurs in characteristic aspect from Greenland to Newfoundland and Quebec, and from the Bering Sea region locally southward to the Black Hills, New Mexico and Washington. This is the shrub described by Klotzsch as *Daphnidostaphylis Fendleriana* Klotzsch, Linnaea, xxiv. 80 (1851), and although the Fendler material is more glutinous than most of the European material, it is well matched by a sheet of specimens from the Pyrenees.

The commonest variety in North America is a shrub with the branches invested with a dense canescent almost felt-like minute tomentum, which is persistent, at least for several years. This variety, which is apparently restricted to North America, does not extend so far north as the typical form of the species, but is very general through the southern half of its range, especially in the East.

The most extreme variation is a shrub of western Canada and Montana and the north shore of the Gulf of St. Lawrence, which has the branchlets loosely villous, the trichomes viscid and commonly mixed with stipitate glands. These three variants seem so pronounced and to have such well-defined ranges, that it is desirable to designate them as definite geographical varieties.

Arctostaphylos Uva-ursi (L.) Spreng., var. **coactilis**, n. var., ramulis canescento-tomentulosis, non viscosis, tomentulo persistente.

Branchlets canescent-tomentulose, not viscid, the minute tomentum persistent.— Newfoundland to Yukon, south to Virginia, Indiana, Illinois, and in the mountains to Colorado and northern California. The following, among the numerous specimens examined, are cited as typical. Newfoundland: gravelly terrace of Exploits River, Grand Falls, August 12, 1911, *Fernald, Wiegand & Darlington*, no. 6029; dry limestone barrens, Ingornachoix Bay, August 1, 1910, *Fernald, Wiegand & Kittredge*, no. 3847. Quebec: sandhills, Coffin Island, Magdalen Islands, July 19, 1912, *Fernald, Bartram, Long & St. John*, no. 7910. Prince Edward Island: sandhills, Bothwell, August 24, 1912, *Fernald, Long & St. John*, no. 7911. Nova Scotia: dry open soil, Kentville, August 22, 1902, *Fernald.* Maine: dry bank, Pembroke, August 15, 1909, *Fernald*, no. 2040; open sandy woods, Brunswick, May 18, 1899, *E. B. Chamberlain* (type, in Gray Herb.). New Hampshire: Newington, May 26, 1890, *C. H. Morss;* dry, open ground, Peterboro, June 12, 1908, *Rand & Robinson*, no. 443. Massachusetts: rocky hill, Waltham, May 1, 1898, *E. F. Williams;* Plymouth, April 25, 1865, *Wm. Boott;* Chilmark, April 25, 1897, *S. Harris.* Rhode Island: East Providence, April 28, 1906, *E. S. Reynolds*, no. 0618. Connecticut: dry granite rocks, Guilford, May 8 and August 14, 1906, *G. H. Bartlett.* Virginia: near Luray, August 25, *Steele*, no. 211. Ontario: Battersea, August 18, 1898, *J. Fowler.* Indiana: dry pine-barrens, Edgemoor, July 24, 1906, *Lansing*, no. 2600. Illinois: dry sand-ridges, Waukegan, August 17, 1906, *Gleason & Shobe*, no. 343. Michigan: bare dune, Hamlin Lake, Ludington, 1910, *Chaney*, no. 164. Wisconsin: Camp Douglas, August 12, 1891, *E. A. Mearns.* Manitoba: Lake Winnipeg Valley, 1857, *Bourgeau.* Wyoming: Tabernacle Butte, August 31, 1894, *Nelson*, no. 1126; open steep slopes, Sheep Mountain, Sept. 2, 1903, *Goodding*, no. 2094. Colorado: *Clements*, no. 82. Yukon: 1898–

1901, *Maclean.* British Columbia: shore of Howser Lake, Selkirk Mts., June 17, 1905, *Shaw,* no. 707. Idaho: Craig Mts., Nez Perces County, May 20, 1892, *Sandberg, MacDougal & Heller,* no. 204. Washington: Hangman Creek, Spokane County, May 24, 1893, *Sandberg & Leiberg,* no. 69. California: Humboldt Bay, May, 1901, *H. P. Chandler,* no. 1133.

A. Uva-ursi, var. **adenotricha,** n. var., ramulis petiolisque viscoso-villosis, pilis cum glandulis nigris stipitatis mixtis.

Branchlets and petioles viscid-villous, the pubescence mixed with stipitate black glands.— Saguenay County, Quebec, Saskatchewan, British Columbia and northwestern Montana. Quebec: Seven Islands, August 4, 1907, *C. B. Robinson,* no. 732; Mingan, June, 1909, *C. W. Townsend.* Saskatchewan: 1857–8, *Bourgeau.* British Columbia: high rocks above Emerald Lake, July 4, 1904, *C. H. Shaw,* no. 5200, in part; stony hillside, Golden, May 11, 1888, *C. F. Batchelder* (type, in Gray Herb.). Montana: Spanish Creek, Gallatin County, Sept. 20, 1901, *J. Vogel.*

Gray Herbarium.

Carex maritima in Marshfield, Massachusetts.— On July 4, 1914, Judge J. R. Churchill and I found specimens of *Carex maritima* O. F. Mueller, growing in the landward edge of the salt-marsh near the Marshfield station. The plants were small, not over half the size of the average specimens I have seen on the Maine coast. This is a southward extension of range of about thirty miles. The southernmost station given by the Local Flora Committee is Cambridge.— Clarence H. Knowlton, Hingham, Massachusetts.

Carex leptonervia a Valid Species.— Since the publication of the northernmost representative of *Carex laxiflora* Lam. as *C. laxiflora,* var. *leptonervia* Fernald, Rhodora, viii. 184 (1906), the writer has watched the plant with great care both in the field and in the herbarium and has found it so constant in its characters and so pronounced in its range that he is satisfied that it is a Canadian species quite distinct from the more southern complex comprising *C. laxiflora* and the other plants which are often placed with it as varieties. In all these southern plants, which reach their northeastern limit in New England or adjacent Canada, the perigynium is strongly nerved, but in *C. leptonervia* the smaller perigynium is nerveless or essentially so. The latter plant, as originally indicated, belongs to a rather northern area,

extending south only in the cooler or upland districts. It is the only representative of the group to which it belongs about the Gulf of St. Lawrence and in Newfoundland and it extends northward to Newfoundland Labrador, where it is a component of a truly boreal flora. In the second edition of Britton & Brown's Illustrated Flora the plant is reduced outright to synonymy by Mackenzie under *C. anceps* Muhl. or *C. laxiflora*, var. *patulifolia* (Dewey) Carey; but that much larger plant has larger strongly-nerved perigynia and belongs distinctly to a more southern area, reaching its northeastern limit of distribution in the warm deciduous woods of southernmost Maine. The northern plant should be called

Carex **leptonervia** (Fernald), n. comb. *C. laxiflora* Lam., var. *leptonervia* Fernald, Rhodora, viii. 184 (1906).— M. L. Fernald, Gray Herbarium.

ERRATA.

Page	10,	line	40;	*for* Lehm. *read* S. F. Gray, Brit. Pl. ii. 581 (1821).
"	13,	"	20;	for *punicens* read *puniceus*.
"	27,	"	19;	at beginning of line insert [. at end of same line add].
"	27,	"	21;	at end of line omit].
"	38,	"	26;	for L. read Lycopodium.
"	39,	"	17;	for J. read Juncus.
"	39,	"	26;	for P. read Polygonum.
"	76,	"	1;	for *Cephas* read *Cepha-*.
"	117,	"	27;	*for* name *read* namer.
"	130,	"	30;	*for* cm. read *mm*.
"	166,	"	19;	*for* trigonis *read* trigono-.
"	176,	"	9;	*for* 20 *read* 30.

On title-page of September number; for **Panicum wrightianum in Connecticut** read **Panicum wrightianum in Long Island**.

Vol. 16, no. 191, including pages 185 to 200, was issued 17 December, 1914.

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